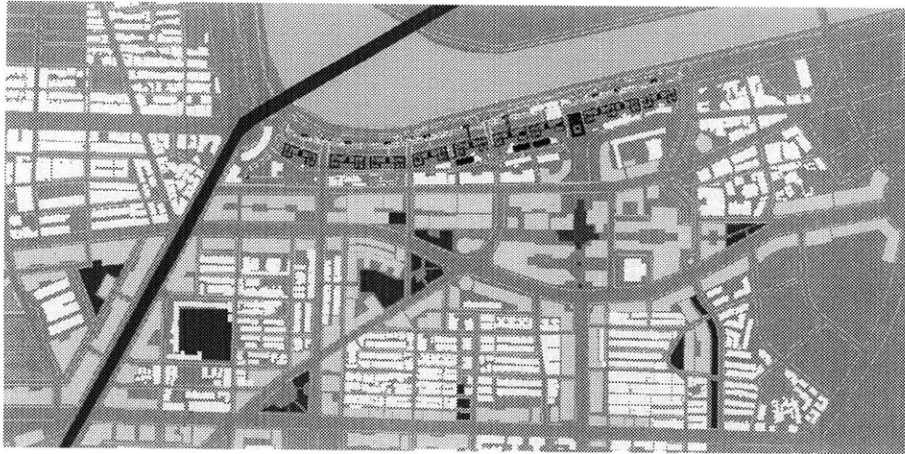


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A New Vision For Taipei's Sung Shan Riverfront District



by

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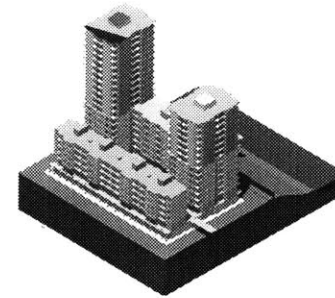
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ABSTRACT

A New Vision For Taipei's Sung Shan Riverfront District proposes a master plan and housing prototype for an 8 hectare site in eastern Taipei. The site, like many other older commercial and housing districts in Taipei, is under substantial development pressure. This thesis envisions redevelopment of the riverfront district at much higher densities and proposes design guidelines and architecture to create a better sense of place.

This thesis identifies opportunities within the site to create a richer urban environment. Preservation of important elements in the Riverfront District, such as the night market, temple, and green spaces is critical to its identity. Joint development at mass-transit stations create public plazas and commercial nodes which then serve as destinations for a new pedestrian network. Bridges connect to other blocks as well as new riverfront amenities. A courtyard housing form is the key to this vision. Spaces within private developments are created and integrated with the pedestrian network and are protected by strong commercial edges. Economic rationale and implementation strategies further root the vision in a realistic framework for development.

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After nine years (one-third of my life) at the same school there are almost too many people to remember.

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Many more belong here.

TABLE OF CONTENTS

<i>Acknowledgements</i>	4	<i>Appendix A</i>	<i>Enclave City: A Design Framework</i>	79
<i>Illustrations</i>	7	<i>Appendix B</i>	<i>Patterns of City Form</i>	91
		<i>Appendix C</i>	<i>Costing Models</i>	95
		<i>Appendix D</i>	<i>Presentation Boards</i>	99
I. Introduction				
Overview	9			
Methodology: Process and Product	13			
II. Taipei Context				
Physical Description	17			
Development Trends and Regulatory Context	24			
III. Sung Shan District and the Riverfront Site				
Physical Context	35			
Sung Shan Riverfront Study Site	37			
Trends in Sung Shan District	40			
Urban Design Impacts	41			
IV. The Vision for the Riverfront District				
Goals	43			
Design Description	51			
Phasing	55			
Impacts	66			
V. Implementation				
General Implementation Methods	69			
Costing Model	72			
VI. Evaluation	75			
References	77			

ILLUSTRATIONS

Figures

- | | | | |
|-----------|---|-----------|--|
| Fig. 1-1 | Sung Shan District and Riverfront Design Site | Fig. 2-21 | Sign Beautification Initiative by the Department of Urban Design |
| Fig. 1-2 | View of Keelung River | Fig. 2-22 | Taipei Main Train Station Development |
| Fig. 1-3 | View of Jaoho Night Market Street | Fig. 2-23 | Proposal for Chung Shan Cultural District |
| Fig. 1-4 | Plan of Riverfront Design Site | Fig. 2-24 | Nankang District Proposal (Riverfront District is at Western Edge of Plan) |
| Fig. 1-5 | Computer Rendering of Design Proposal | Fig. 2-25 | Primary Uses in Taipei |
| Fig. 1-6 | Deteriorating Housing in the Riverfront Site | Fig. 2-26 | Incompatible Mixed Uses of Housing |
| Fig. 1-7 | Sectional Study Model | | |
| Fig. 1-8 | Computer Model of Existing Housing and Proposal | | |
| Fig. 1-9 | Physical Model of Proposed Housing | | |
| Fig. 2-1 | Taipei Metropolitan Area in 1920, 1945, and 1983 | Fig. 3-1 | Gate of Jaoho Night Market Street in Sung Shan District |
| Fig. 2-2 | Traffic Congestion | Fig. 3-2 | Plan of Sung Shan District around the Study Area |
| Fig. 2-3 | Route of Highway along Railway Corridor | Fig. 3-3 | Keelung Traffic Circle and River at the West End of the Site |
| Fig. 2-4 | Rendering of Highway Section | Fig. 3-4 | The Sung Shan Riverfront District Defined |
| Fig. 2-5 | Above-ground MRT Station | Fig. 3-5 | View of Sung Shan Temple from Train Station |
| Fig. 2-6 | MRT Routes | Fig. 3-6 | Flood Wall Along Keelung River |
| Fig. 2-7 | Entrance to the Sun Yat-Sen Memorial | Fig. 3-7 | Trees and Parking along Riverfront Road |
| Fig. 2-8 | Public Recreation at the Sun Yat-Sen Memorial | Fig. 3-8 | Plan of Sung Shan Train Station South of the Temple |
| Fig. 2-9 | Sung Shan Temple's Visual Connection with Taipei's Mountains | Fig. 3-9 | Proposed Train Station Redevelopment |
| Fig. 2-10 | Modern Facade Reflects the Growth of Taiwan's Economy | Fig. 3-10 | Expressway Forms an Edge at Keelung Road |
| Fig. 2-11 | Commercial Buildings on Chunghsiao Road | Fig. 3-11 | Traffic on the Ground at Keelung Traffic Circle |
| Fig. 2-12 | Traditional Architecture in Old Taipei | Fig. 4-1 | Planned Mass Transportation Stations in Design Site |
| Fig. 2-13 | Courtyard Plan of Traditional Housing | Fig. 4-2 | Street Infrastructure in Sung Shan District |
| Fig. 2-14 | Two-story Housing from the Pre-1953 Era | Fig. 4-3 | Public Spaces in the Riverfront District |
| Fig. 2-15 | Three-story Housing dating back to the 1950's | Fig. 4-4 | Waterfront Area in Nice, France |
| Fig. 2-16 | Four-story Walk-up Housing of the 1960's | Fig. 4-5 | Creating Experiences Along a Path |
| Fig. 2-17 | Existing Housing Fabric | Fig. 4-6 | Modification from Single-grained to Multi-grained City Fabric |
| Fig. 2-18 | Housing in the Riverfront District Along Night Market Street | Fig. 4-7 | Rendered Plan of the New Vision for the Riverfront District |
| Fig. 2-19 | High-Density Public Housing Development | Fig. 4-8 | Creation of Enclaves Within Three Earlier Schemes |
| Fig. 2-20 | Public Housing Projects Contain Kindergartens and Other Amenities | Fig. 4-9 | Diagram of the Vision for the Study District |
| | | Fig. 4-10 | Proposed Street Pattern |

Fig. 4-11	Courtyard Housing Prototype for the Riverfront District
Fig. 4-12	Proposed Open Spaces
Fig. 4-13	Keelung Plaza and Adjoining Park
Fig. 4-14	The Riverfront Design Site
Fig. 4-15	Proposed Street Infrastructure in the Design Site
Fig. 4-16	Proposed Riverfront District from the West
Fig. 4-17	Public Pedestrian Network
Fig. 4-18	Public Path to Riverfront
Fig. 4-19	Second Story Pedestrian Network
Fig. 4-20	Pedestrian Network Bridges across Riverfront Road
Fig. 4-21	Keelung Plaza and Park Mark Western End of Site
Fig. 4-22	Keelung Plaza from Railway Commercial Development
Fig. 4-23	Temple Plaza Terminates Jaoho Night Market Street
Fig. 4-24	Gate at Temple Plaza Creates a Sense of Place
Fig. 4-25	Roof Housing and Amenities are Encouraged
Fig. 4-26	Intensified Nankang Commercial Street Edge
Fig. 4-27	Proposed Courtyard Housing Type
Fig. 4-28	Housing Blocks in the Design Site
Fig. 4-29	Ground Floor Isometric
Fig. 4-30	Ground Floor Plan
Fig. 4-31	Second Floor Isometric
Fig. 4-32	Second Floor Plan
Fig. 4-33	Residential Floor Isometric
Fig. 4-34	Residential Floor Plan
Fig. 4-35	Tower Floor Isometric
Fig. 4-36	Tower Floor Plan
Fig. 4-37	Proposed Building Facade
Fig. 4-38	Housing Enclosure Modules
Fig. 4-39	Claiming of Facade by Residents
Fig. 4-40	Proposed Phasing
Fig. 4-41	First Phase is Sung Shan Temple Plaza
Fig. 4-42	Housing Form Attempts to Preserve Jaoho Street

Fig. 5-1	View of Jaoho Street from the East
Fig. 5-2	The New Riverfront for Sung Shan District

Fig. 6-1	Can Jaoho Street Survive Redevelopment?
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Tables

Table 1	Projected Growth in Sung Shan District
Table 2	Unit Sizes in Housing
Table 3	Site Program
Table 4	Phasing Schedule
Table 5	Strategies for Implementation
Table 6	Costing Summary

I. INTRODUCTION

OVERVIEW

Sung Shan District is an eastern district in Taipei and is undergoing enormous change as development pressures continue to force manufacturing and industrial uses within the district to relocate to other parts of Taiwan. Replacing these uses are intense commercial and residential developments. The Sung Shan Train Station, within the district, is now undergoing redesign from a minor stop in a regional rail system to a major stop in a commuter rail network. New subway lines are slated to be built linking the area to the rest of central Taipei.

The opportunities for Sung Shan Riverfront District are many, and could provide the setting to demonstrate innovative ways for Taipei to address its urban problems. There is an opportunity to create a new dynamic between the city and the river. Another important feature of the Riverfront District is the Jaoho Night Market Street. Under pressure of redevelopment, it is unlikely that the Night Market would be preserved in its entirety. Alternative strategies could be proposed, however, to move these uses to other parts of the site. Yet another opportunity is the redevelopment of the train station into a powerful architectural entrance for the eastern edge of the city. Its relationship to Sung Shan Temple can define a new public realm for this area of Taipei.

Portions of Sung Shan District has also been home to the working class. Other areas in Taipei that have been redeveloped at higher densities have displaced the people living there and have lost much of their character. A new develop-

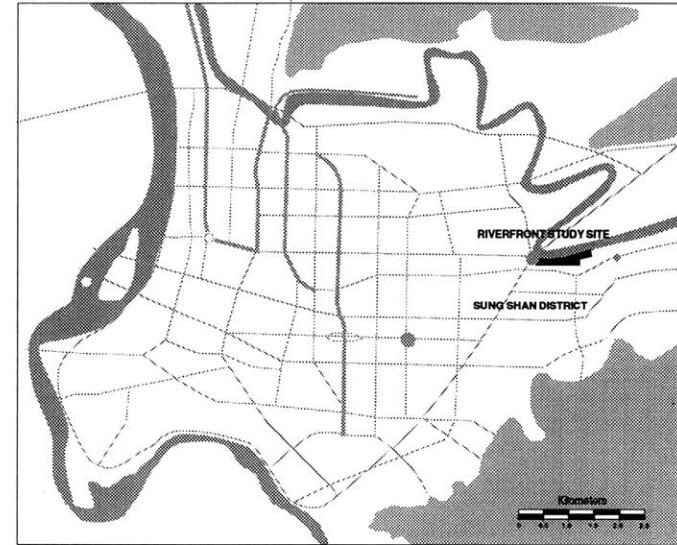


Fig.1-1 Sung Shan District and Riverfront Design Site

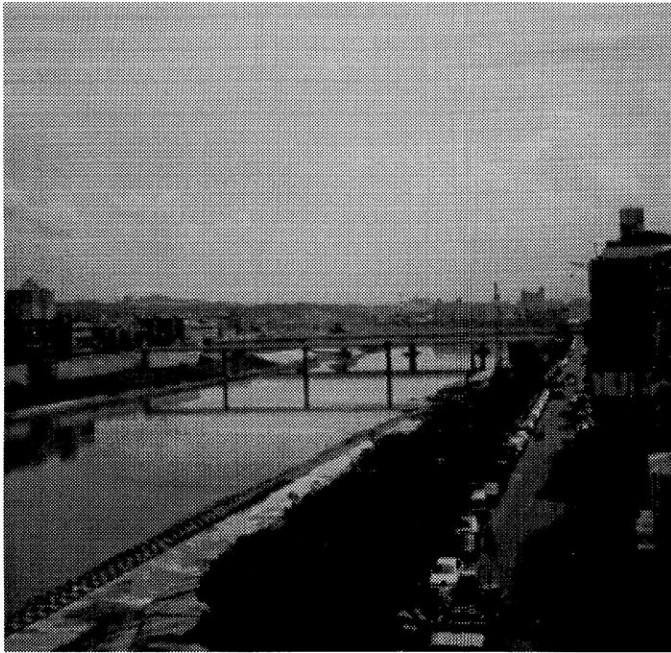


Fig. 1-2 View of Keelung River

Fig. 1-3 View of Jaoho Night Market Street



ment scenario should preserve socio-economic balance in the area, while also making redevelopment financially affordable.

Sung Shan District will be impacted by transportation improvements over the next few decades, beginning with the new East-West highway for Taipei and including a redevelopment of the Sung Shan Train Station and a new east-west subway line with two stops along the riverfront. Use of this area will increase dramatically. It is critical to examine the specific opportunities that this area offers for a high density redevelopment scenario that retains the unique character of this area.

This document defines the amenities, strengths, opportunities, and limitations of the site. It proposes a new vision for this site, following a careful, objective analysis of data and other plans. This vision will address issues of conservation, connection to natural resources, integration of transit with development, creation of a new image of the city, and exploration of a new building form. Physical design and documentation will be supplemented by overall design guidelines. These guidelines reflect land-use, transportation, open space, and urban design policies for public discussion and eventual adoption by the Taipei Government with suggestions for funding strategies and mechanisms.

The site for this thesis is an eight hectare portion of Sung Shan District. This Riverfront District Site (also referred to in the document as Riverfront Study Site, Riverfront Development Site, or simply, Riverfront Site) is bordered by Nankang Road to the south and Keelung River to the north. Its western border is Keelung Road, and its eastern border is an inlet of the Keelung River.

The Vision For Sung Shan Riverfront District

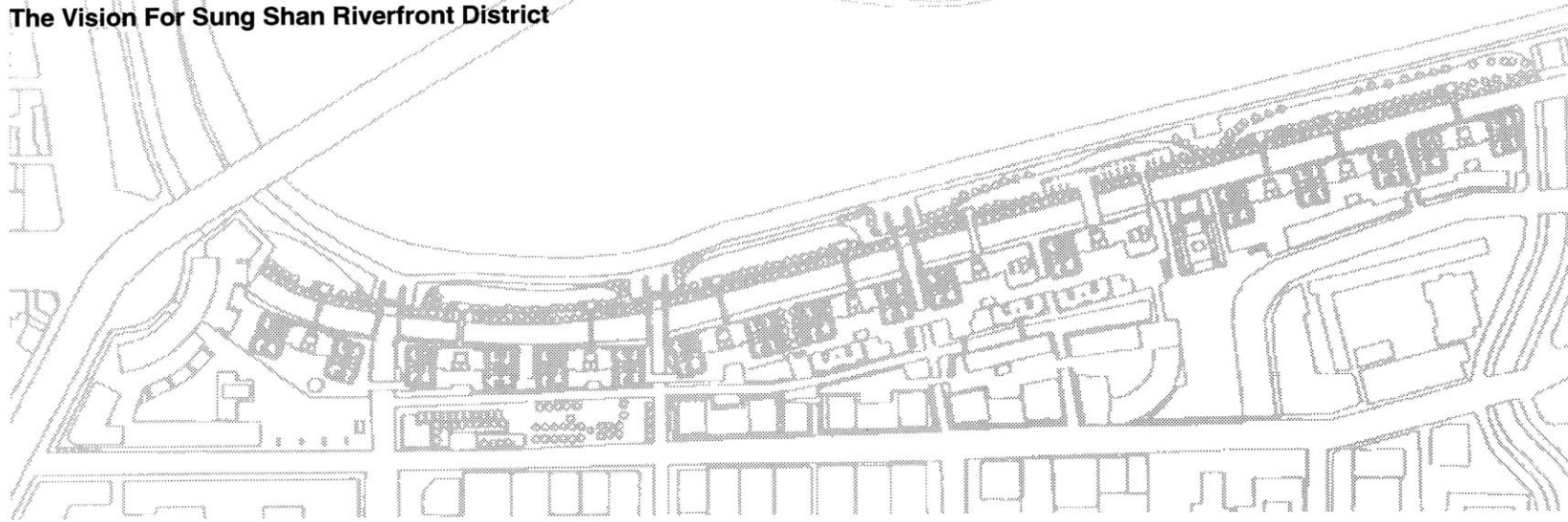
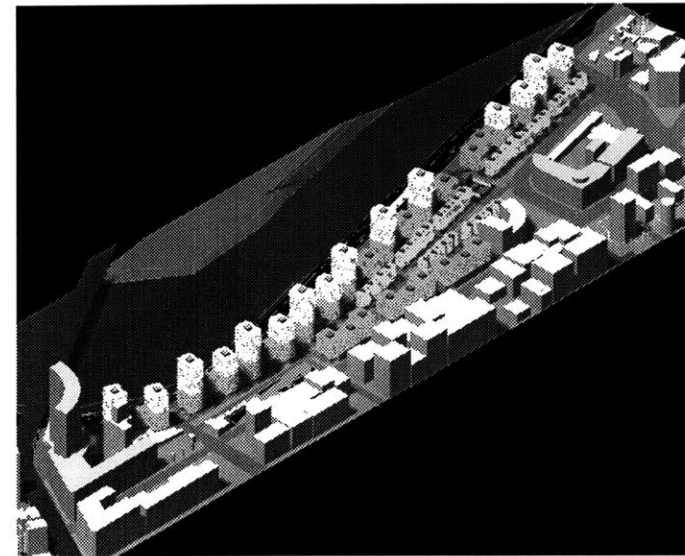


Fig. 1-4 Plan of Riverfront Design Site

The Riverfront Study Site will be under considerable redevelopment pressure in the future. The area has a wealth of natural and urban elements which could be the basis of a livable urban environment, even at high densities. This thesis proposes an urban design and architectural vision for the Sung Shan Riverfront District. This new vision capitalizes on the transportation improvements planned for the area. At the western and eastern ends of the site are high-density urban plazas which mark the new subway stops and offer a strong link to the riverfront. Between these two new nodes is a housing district which preserves the original housing and street character. Courtyard spaces shaped by a new housing prototype are shared with the street and connect to each other and the riverfront through a network of above-ground walkways.

To create a sense of place, Taipei must integrate new development within its context. This thesis proposes that a successful redevelopment of the Sung

Fig. 1-5 Computer Rendering of Design Proposal



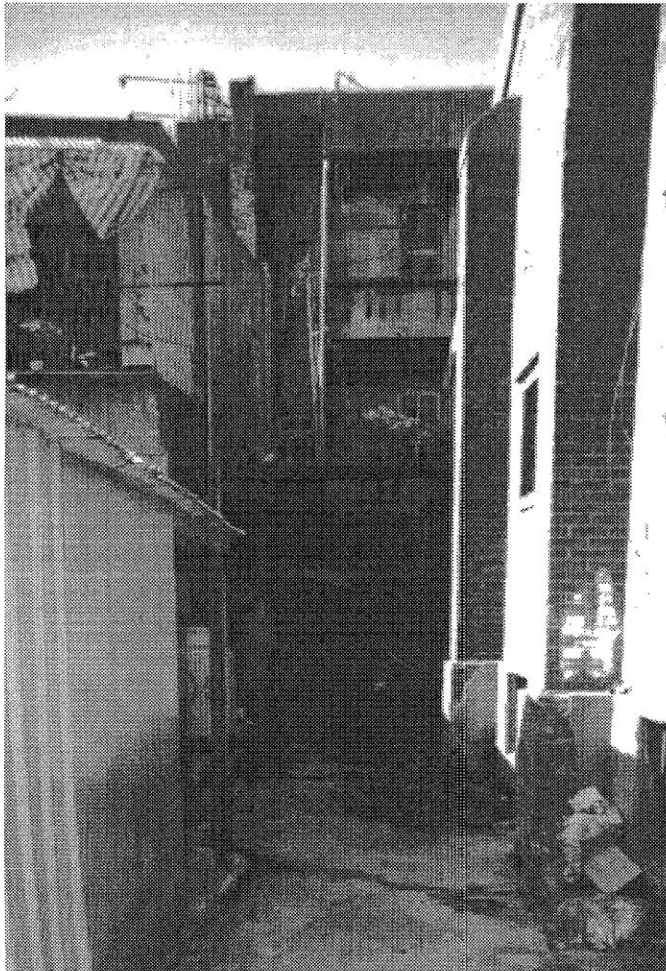


Fig. 1-6 Deteriorating Housing in the Riverfront Site

Shan Riverfront District would emphasize the amenities already there: the Keelung River, the Jaoho Night Market, the Sung Shan Temple, and the Sung Shan Train Station.

The proposed density for the redevelopment scenario for the Sung Shan Riverfront District is roughly double that existing. The Floor Area Ratio (FAR) is raised from 3.5 to 6.6 for a development block in order to provide enough economic incentives to justify the costs of redevelopment. For the whole site, the FAR is 6.0. The redevelopment scenario aims to maintain the same number of units at current rent, and creates new market-rate units.

The study employs models and drawings which analyze the architectural character of housing. One north-south “slice” of the design site that addresses many of the relevant issues represents the prototypical design solution. Other design solutions present variations of this prototype and reflect site specific conditions, such as an edge, open space or transportation node. These architectural designs form the building envelope at the urban design scale.

Structure Of The Document

This document will first familiarize the reader with the municipal context and development patterns in Taipei, before embarking on a discussion of issues at the district and site levels. A master plan for the area and final design for a new housing type in its final form is presented within the Vision chapter, and a discussion of implementation strategies and costing models follows. The thesis document concludes with an evaluation of the proposed design.

METHODOLOGY: PROCESS AND PRODUCT

This thesis defines a new vision for the area using diagrams, master plans, and models. These techniques work in concert to provide a full picture of the character and quality of the spaces prescribed for the study site.

Master Plans. New zoning follows the established guidelines, but is flexible enough to sustain the healthy uses on the site and prevent unhealthy uses. The healthy uses are residences, retail stores, public spaces, and Night Market activities. Unhealthy uses included the light industries, deteriorating service alleys, and on-street parking. The control and organization of uses help dictate the urban design and provide clues for planning. These designs were modeled in three-dimensional form to investigate issues of integration, massing, and connections within its urban context.

Architectural Models. Both physical and computer models of the housing prototype were generated to test the existing and new urban spaces. Further studies examined ways owners could “mark” their spaces by designing the organization of their unit or unit closure. These studies reflect the evident exterior quality of housing in Taipei.

Implementation Strategies. New implementation strategies would not be possible without the status of Special Development District for the study site. The government can use a variety of mechanisms to promote development at different levels. Strategies are suggested for several elements of the development.

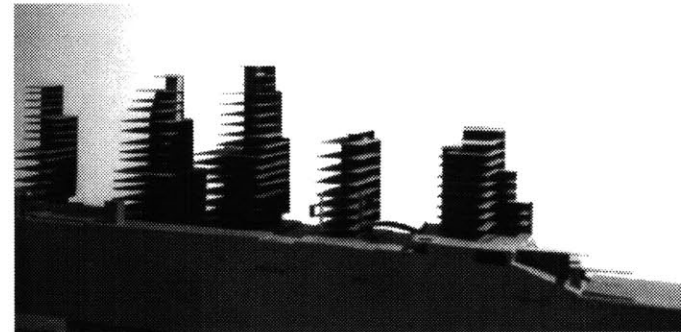


Fig. 1-7 Sectional Study Model

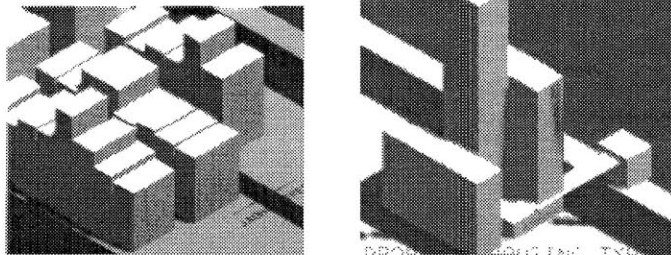


Fig. 1-9 Computer Model of Existing and Early Proposed Housing

It is necessary to design at the site and architectural scales. The site scale provides a vision of good urban spaces, and the architectural scale helps define those urban spaces. While only the final stage of design is presented in this document, this design emerged from a process employing both urban and architectural design analysis to arrive at its vision for the Sung Sang Riverfront District. Techniques used in this exploration include:

Precedent Study. MIT Taipei Urban Design Studio (Fall of 1994) provided the preliminary research and analysis used of the district level. This thesis uses the road network proposed in Enclave City, an urban design scheme proposed in this studio. Basic concepts proposed in this scheme regarding the form of neighborhood units have also been adopted and refined. These criteria are explained in more detail in the Vision Chapter.

Sectional Models. These models were used to study the relationship between buildings and the riverfront. These models propose road widths, street walls, and building envelopes to form an appropriate streetscape. This modeling technique examined a second-story deck which connects from the housing to the river.

Housing Prototype. The housing prototype and zoning work in tandem to create a new urban residential environment. The housing prototype evolved from a tower-plus-slab to a courtyard building form with towers on top. Commercial uses are placed along the public spaces of the site, and residential areas overlook the riverfront. The evolution of the housing form creates new public and private levels and makes connections to the river. The housing

prototype was then reinserted into the master plan and modified to respond to specific site conditions, such as public plazas and streets.

Financial Modeling. The model examines the return on investment for the proposed housing block. The model is sensitive to rental rates for commercial and residential spaces. A banking model includes variables of loan interest rates for public and private loans.

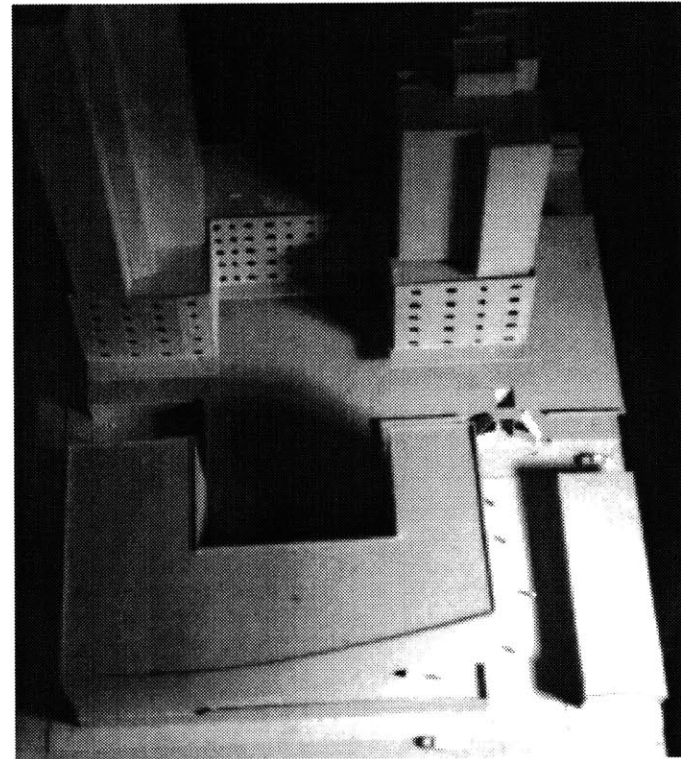


Fig. 1-10 *Physcial Model of Proposed Housing*

II. TAIPEI CONTEXT

PHYSICAL DESCRIPTION

Street And Block Hierarchy

Roads in the City of Taipei are organized on a clear grid system. The north-south roads form a grid pattern with large arterial streets every 800 meters. The arterial roads, usually six to eight lanes (30-40 meters), reinforce the north-south and east-west axis that has its roots in Old Taipei. Founded in the 1700's, Old Taipei is clearly demarcated by the modern Chunghsiao, Chungshan, Aikuo and Chunghua roads. The three people's ("Min" means people) roads, Mintsu, Minchuan, and Minsheng, as well as Chunghsiao, are the great boulevards which extend commercial spines into the relatively unbuilt eastern parts of the city.

Jenai Road is a large formal boulevard on which lie elements which signify the eastward expansion of the city. The Presidential Palace sits at the terminus of the western and older end of this road near the East Gate of the Old City. At its eastern end is the modern Taipei City Hall, which is shaped in the form of "double-tens" as written in Chinese script. Adjacent to the Exposition Center and World Trade Tower, this structure anchors a proposed world-class commercial district. It is clear that while Old Taipei may have expressed political power, the "New Taipei" revolves around global economic power.

By Western standards, the arterial streets function efficiently. However, the

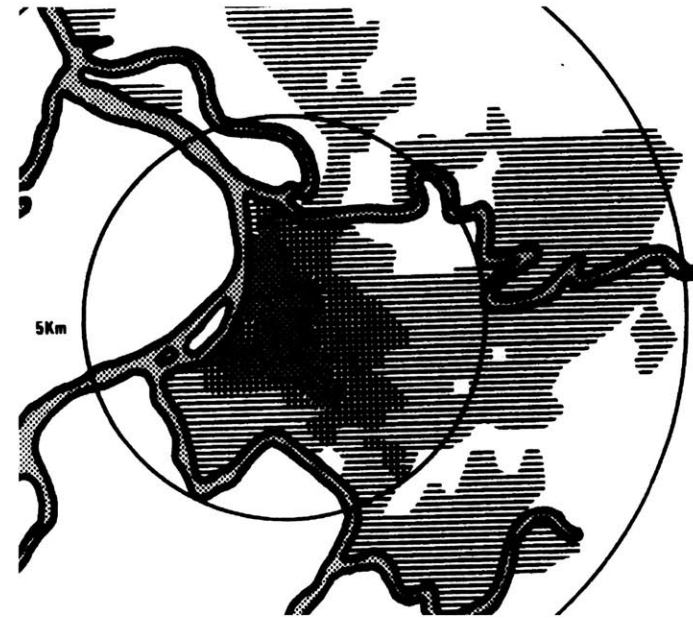


Fig. 2-1 Taipei Metropolitan Area in 1920, 1945, and 1983



Fig. 2-2 Traffic Congestion

subway and elevated rail construction on the roads have decreased their performance. And, while the mid-block (at 400 meter intervals) collector streets seem to function well, block-level streets are congested.

The traffic problem in Taipei is tied to its zoning. While official zoning maps locate commercial uses along larger roads, commercial uses occur deep within these 800 meter megablocks. As a result, these uses saturate the collector streets. Rather than using collector streets to feed the arterial streets, Taipei has a non-hierarchical system where even small alleyways (sometimes only three to four meters wide) can feed directly onto these arterial streets and cause traffic congestion.

Transportation

The explosive growth of Taipei over the last 30 years has caused a dramatic growth of the suburbs surrounding the city. It has, in turn, caused even more traffic congestion and increased commuting time to and from work. It is not unusual to find workers traveling two hours each way. Besides creating new commercial zones around transportation nodes to alleviate congestion, the City of Taipei has embarked on an ambitious plan to adapt old infrastructure and build new ones. The existing freight and passenger train lines, for example, will be converted to commuter use. A new East-West Expressway to relieve cross-town traffic is in construction. Several new subway and above-ground light rail vehicle lines already have been built.

Rail Transportation. Historically, Taipei Train Station located at the edge of

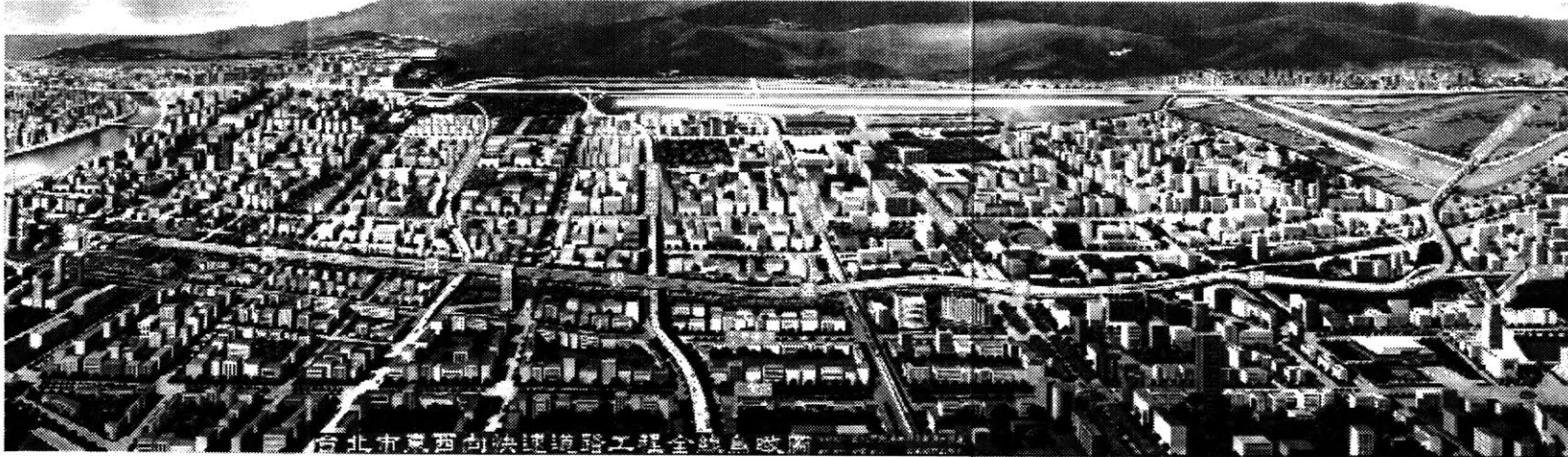


Fig. 2-3 *Route of Highway along Railway Corridor*

the Old City has received almost all of the passenger traffic from northern Taiwan. As the city has grown, however, this traffic pattern seems perverse, as passengers sometimes have to take another train outbound to a station where their inbound train does not stop. The answer is to turn many of its district train stations into commuter rail stations, and to increase the passenger capacity of the existing rail lines while diverting freight traffic around the city.

This strategy has many implications for the city. First, it decentralizes downtown and form new growth around district train stations, a condition which will dramatically impact the Study Site. The second implication is a change in the perception of the railway in the city. Commuter lines do not need as much right-of-way as freight trains, and are much less disruptive due to their smaller number of cars. Furthermore, the Taiwan Railway Authorities have submerged these commuter lines to allow new open spaces on top of the tracks.

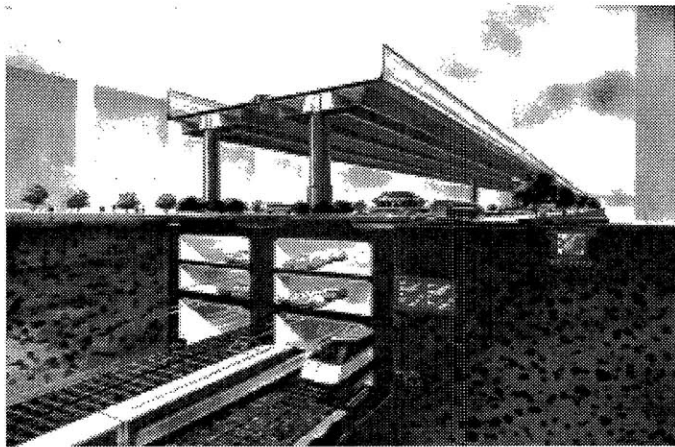


Fig. 2-4 *Rendering of Highway Section as Proposed by Taiwan Rail Authority*

The Railway Depression Study prepared by the Taiwan Railway Authority submerges the rail line within Taipei and envisions a corridor with imageable events along its length within Taipei. The Sung Shan Train Station is an integral part of this linear experience as it connects spaces from the Old City through Wanhua District and to the newly booming Nankang District.

East-West Expressway. A seven-kilometer elevated east-west expressway is being constructed from the Chunghsiao Bridge at the Tamshui River to Keelung Road in the air rights corridor of the depressed railway. The expressway is 25 meters wide throughout its length, cutting Taipei in half. At exits and on-ramps this width sometimes reaches 30 to 35 meters.¹

The expressway has exit ramps at several points near the Sung Shan Riverfront District, just north of Chungshan Art District and also at the intersection of Yungchi and Keelung Roads. From this intersection, it takes a turn towards the north-east and crosses the Keelung River at the site of the River Straightening Project.

The expressway will act as a new physical barrier throughout most of Taipei. While it can be argued that it will be easier to make connections underneath the highway 10 meters above the ground, any new growth will turn its back to this divisive infrastructure, just as older development turned its back to the railroad. The new expressway will be even more intrusive than the railway with respect to shadows, noise, and pollution, and will be seen as an unfriendly edge condition to face away from rather than towards.

Metropolitan Rapid Transit (MRT). Beginning in the 1980's, the City of Taipei has pursued mass transit in the form of subways and elevated light rail vehicular systems. To date, the main north-south Red Line has been completed. The Blue Line is configured to carry traffic from Tucheng, in Taipei County southwest of the city, to Nankang, the district east of Taipei. Four stops are in Sung Shan District: Sun Yat-Sen Memorial, City Government, Sung Shan and Hou Shan Pi. These stops, however, do not offer direct connections to the Sung Shan Train Station. The Blue Line will be completed in 1997.

Another proposed east-west line will carry passengers across the northern half of the city. This line, to begin construction in ten years, will have stops in the Sung Shan Riverfront District at its western end and one directly in front of the Sung Shan Temple. This stop would then be connected to the Sung Shan Train Station, creating more efficient transfer of passengers to the Metropolitan Rapid Transit system without the need for another mode of transportation.

Public Spaces and Landmarks

There are few public spaces in Taipei that are not associated with an institution or landmark. For recreation, many Taipei citizens head for the mountains during the weekend. On early weekday mornings, however, school assembly grounds are teeming with people of all ages practicing Tai Chi or other forms of exercise. Other popular assembly spaces are the Chiang Kai Shek Memorial and its surrounding parks and the Sun Yat Sen Memorial at the eastern end of the city. These public spaces have historically been organized along Jenai Road, emphasizing its public nature.



Fig. 2-5 Above-ground MRT Station

Fig. 2-6 MRT Routes

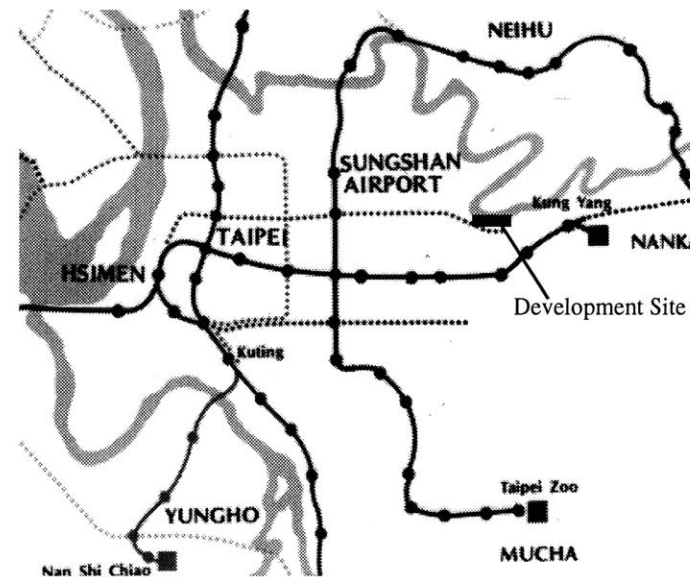




Fig. 2-7 Entrance to the Sun Yat-Sen Memorial

Fig. 2-8 Public Recreation at the Sun Yat-Sen Memorial



Many Taipei residents feel that there is a general reputation “for caring very little about what the public parts of their city looks like.”² Instead, each building is individualized for maximum commercial effect without regard for the overall feel for the street or its neighbors. Architectural significance of cities comes about through the investment of the rulers and wealthy to improve their public recognition and status. Taipei is now in the position of being able to invest its public and private wealth to create a high-quality city with memorable spaces.

Open Space and Natural Elements

The riverfront is a large open space which has been neglected over the years, and subsequently a focus of this thesis. The annual flooding of the Tamshui and Keelung Rivers during typhoon season, for example, required large walls along the riverfronts. As Taiwan became industrialized over the last 30 years, economic growth was more important than sound ecology. As a result, the natural features of Taipei suffered. For many years both the Tamshui and Keelung Rivers were unmanageably polluted and symbolized the decay of the environment. Many buildings turned their backs to the rivers, rather than looking out over them. More recently, however, there have been successful movements to clean up the river and turn around this ecological deterioration. In fact, Taiwan has “the prospect of being a world leader in pollution control before the end of the 1990’s.”³

Numerous public work projects, such as sewage treatment plants and landscaping efforts have also helped to improve the riverfront. There are several schools which have auxiliary practice fields on the flood plains of the river.

These activities have helped the image of the city.

In the eastern and newer portion of the city, the street system is slightly more organic, with more diagonal and curved roads than in the rest of the city. These roads are more likely to follow the natural geography of the terrain. Sung Lung Road in the Sung Shan District is built over a river inlet, and that the water still flows underneath a complex structural system. Some suggest that it is possible to reclaim these natural resources in the future. These natural systems can create a richer context for urban design.



Fig. 2-9 Sung Shan Temple's Visual Connection with Taipei's Mountains

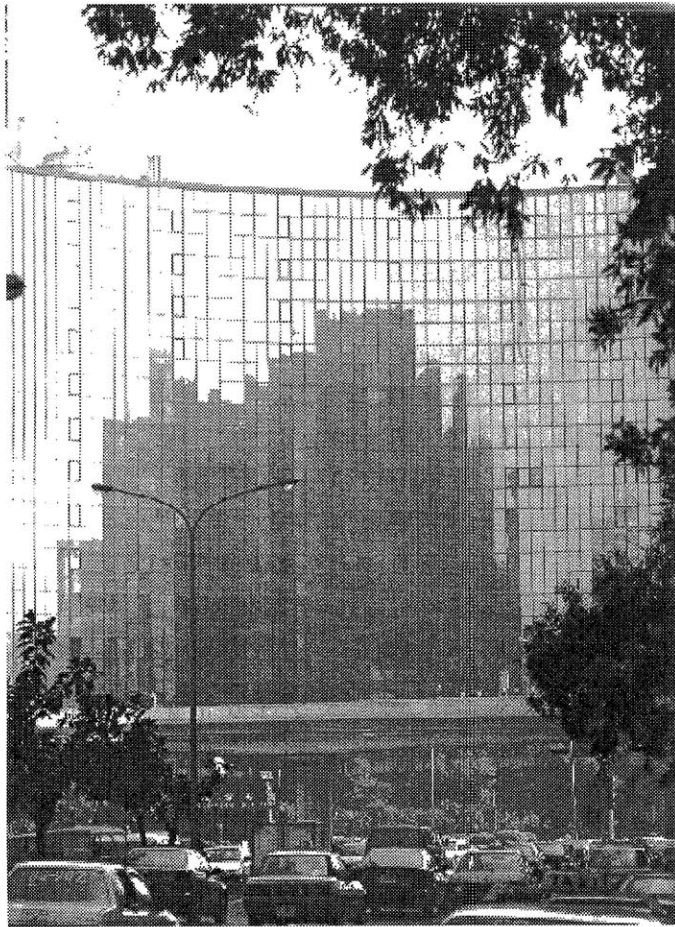


Fig. 2-10 *Modern Facade Reflects the Growth of Taiwan's Economy*

DEVELOPMENT TRENDS AND REGULATORY CONTEXT

A Reflection Of Taiwan's Economic Story

Taiwan's role in the world marketplace has changed dramatically over the last few decades. Once the manufacturer of cheap garments and goods (notably plastics), Taiwan has become a manufacturing powerhouse of personal computer chips and their clones. The island nation has followed a path to prosperity similar to that of Japan, becoming one of the "Little Dragons" whose growth rate has attracted much foreign investment.

The economic success is the result of heavy investment by the country in its own future. In 1973, the government announced the Ten Major Development Projects which modernized highways, railways and ports. Other government projects targeted steel, shipbuilding, petrochemicals, and nuclear power. The targets were met by 1979, at which time the government announced twelve more projects, and six years later announced another round of 14 new projects. Increased growth in the country "more than repaid the investments."⁴ The government policy were directed toward "facilitating the growth of private companies, providing the infrastructure, technology, low-cost capital, and export incentives that private enterprise could take advantage of."⁵

The economic success story can be read in the building facades on Taipei's major streets. The director general of the Interior Ministry's Architecture and Building Research Institute remarks that "architecture is a reflection of the economy and the culture of a place."⁶ In Taipei, the streetscape is full of new

modernist buildings, designed by foreign-educated architects as a symbol of commerce and capitalism in the Bauhaus-inspired International Style. The backdrop for these new buildings, however, are four-story concrete apartment blocks that “satisfied the basic need for low-cost shelter rather than offering aesthetic appeal.”⁷ In 1994 alone, the city issued building permits for more than twelve hundred new buildings, at a construction cost estimated at \$1.9 billion.⁸

Taipei is known as a city of the night, when its neon signs and decorations create a far more interesting experience than the buildings themselves. Many leaders and architects are trying to change this impression, but they encounter historical inertia. Traditional Chinese attitudes may inhibit or limit the attention given to public spaces. Family and family relations take precedence over society and community needs. Thus, people are more concerned with the function of the interior rather than the beauty of the exterior. It is only recently that the government has focused on creating a much better public realm through the use of urban design.



Fig. 2-11 *Commercial Buildings on Chunghsiao Road*

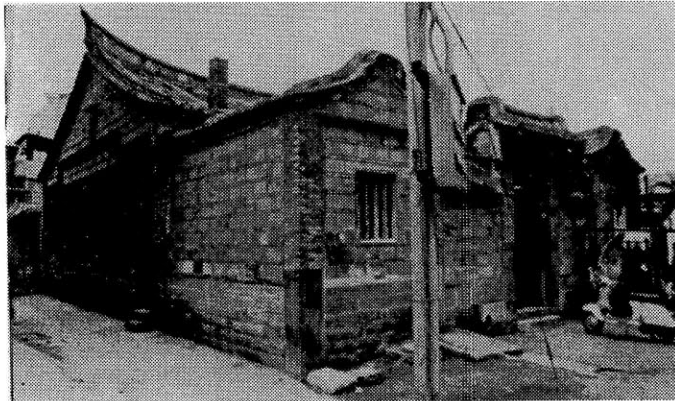


Fig. 2-12 Traditional Architecture in Old Taipei

Fig. 2-13 Courtyard Plan of Traditional Housing

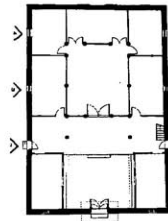


Fig. 2-14 Two-story Housing from the Pre-1953 Era



A Brief History of Housing in Taiwan

During the enormous growth periods over the last thirty years in Taiwan, housing form has changed dramatically. Until 1953, concrete, which was cheap and widely available, was the material of choice for government and public buildings. Housing in Taiwan retained its traditional form, even in the urban context. The bricks used to construct homes could only support two stories, a design constraint that limited the building height. An arcade shielded the entry. The living room, often the coolest room in the house, was located in the center of the first floor. All other rooms were organized around this central common space. Vertical circulation to the second floor was built within the house. This housing form reflected the organization of traditional Chinese housing.

Building technology and its applications advanced in the 1950's. Simple concrete slab construction allowed three-story apartments to be built with a larger floor-plate. A walk-up staircase served two units on each floor. The living and dining rooms in these units fronted the streets, and the bedrooms were pushed to the back of the house. An open service corridor provided air and light to the back of the house.

The form of housing changed slightly in the 1960's through the middle of the 1970's. Typical housing was three stories tall. This form did not push the performance capabilities of concrete construction and has historically been the cheapest by density. (Taller buildings usually require elevators which drives up cost). In addition, it allowed some experimentation with courtyards and variations.

Taiwan's economy and the modernization of building technology boomed in the 1970's. Housing form and articulation began to borrow from the international palette. Tall housing units became a symbol of prestige, besides becoming necessary to sustain Taipei's population growth. Current regulations limit the height of apartment buildings to 12 to 13 stories. These buildings contrast with the 4 story-walkups built during the boom of the last thirty years.

Chinese housing built after the 1940's was designed to be economical and efficient, and did not necessary reflect the organization of the Chinese family. Apart from some domestic fung shui principles, such as never locating the kitchen door in line with the entry door, no overall spatial principles guided architectural design.

As Taiwan has grown and modernized, part of its cultural tendency has been to borrow from other societies, notably the United States. Images of lifestyles are no exception. New slogans for development projects have themes like Grand Park Avenue or American Shopping Mall, which evoke visions of tree-lined boulevards, large open spaces, and supermarkets. These visions are usually contradicted by the reality of small, tight sites with small housing units. This has further complicated the search for true Chinese architectural form.



Fig. 2-15 Three-story Housing dating back to the 1950's



Fig. 2-16 Four-story Walk-up Housing of the 1960's

Regional Housing Trends And Local Implications



Fig. 2-17 Existing Housing Fabric

Taipei sits within an alluvial basin surrounding by mountain ranges. Its topography creates a variety of conditions for urban development. Much of Taipei is uninhabitable due to its mountainous topography. In 1989, the Land Use Sub-division of City Planning of Taipei estimated the area of the city to be 27,122 hectares of which 10,694 hectares (39%) is used for urban development. Of that urban development, roughly 8,400 hectares are residential areas. The balance has been set aside for preservation. With a gross urban density of almost 10,000 persons per square kilometer, Taipei ranks as one of the densest cities in Asia.

Housing Demand. Housing stock in Taipei has been growing steadily in Taipei, at a rate of roughly 20,000 to 30,000 units per year. Growth in supply was most remarkable in 1987, when 38,000 new units were added to the total. This marked the height of the real estate boom in Taipei. Housing starts returned to more familiar levels in the following years with 29,300 households in 1988 and 18,600 in 1989. The size of the average household has been dropping steadily, from 4.31 persons per household in 1970, to 3.43 in 1989. This has placed more demand on smaller units. The trend of single rural workers moving to the city is one explanation for the smaller household size.

The census data also shows that there were 20,700 more households than housing stock in Taipei, a condition that would create a housing demand and a seller's market. A statistic that might seem puzzling in this context is that, in 1990, 9.4% of the total housing stock in Taipei was vacant. This rate is low

compared to the national average vacancy rate, which was 13.3%. This vacancy rate can be explained by the tendency to buy real estate for investment and speculation, and as a safe haven for their money. Often owners worried about the permissible use of their land built housing before zoning was implemented, leaving vacant dwelling units with official addresses which were counted in the surveys.⁹

Housing Types. A traditional house in Taipei is extremely difficult to find. Only 5.6% of the housing stock is either traditional or detached housing. Rather, row houses have been aggressively replaced by walk-up apartments. As building types, the walk-up apartments have the advantage of being more efficient than row houses in terms of density, and less expensive to build than taller housing. For instance, more than half the housing stock is apartments of five stories or less, and only 4.2% are apartment of 13 stories or more. Row houses provide Taiwan with 39.8% of its housing stock, but only make up 10.6% in Taipei. The conclusion is that the row house type in Taipei has been replaced by walk-up apartments of five stories or less.

Age of Housing Stock. In the 1970's, more than 43% of Taiwan's current housing stock was built. Taipei has stayed within three percentage points of the national statistics, though it has become clear that the housing stock from the 1970's, now at least 15 years old, is under much pressure for replacement by higher-density housing types.

From the photographs of the riverfront site, it appears that a large portion of the buildings in the area were built in the 1970's. Several buildings are in the

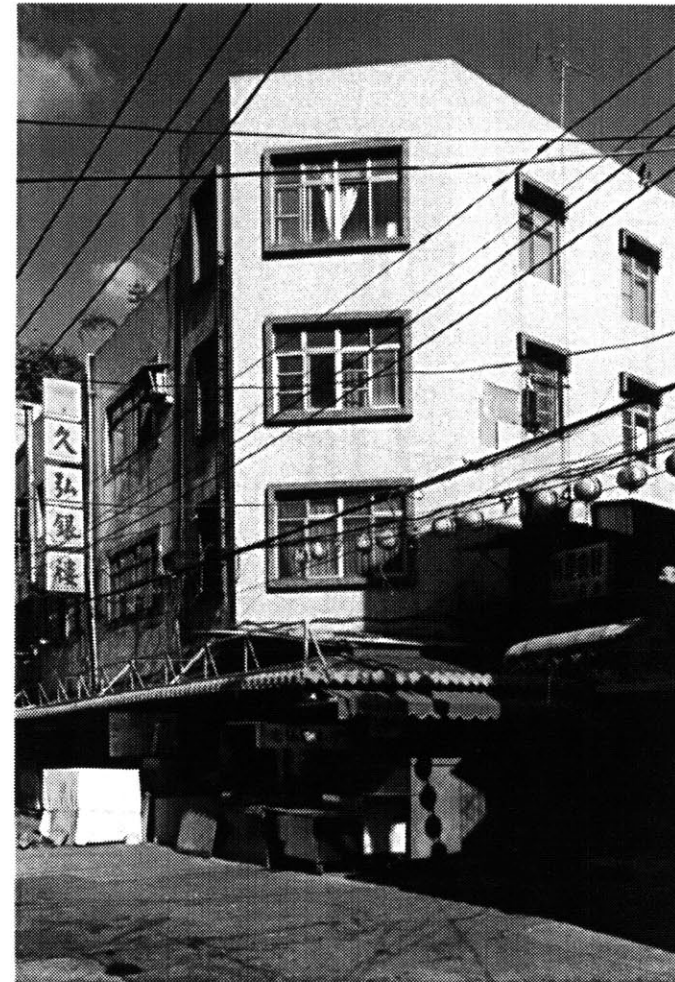


Fig. 2-18 Housing in the Riverfront District Along Night Market Street

process of being replaced. New buildings on Pateh Road have replaced the old housing stock and foreshadow this emerging trend.

Summary. It is clear that new housing in the Sung Shan Riverfront District will replace the old walk-up style housing. The government must provide enough incentives for developers and owners to consolidate properties and develop them at a larger scale and provide amenities which would mitigate the higher density required to make the redevelopment financially feasible. The new housing would most likely have smaller units to provide for the new family profile in Taipei. Public assistance may be needed in order to keep the units affordable.



Fig. 2-19 High-Density Public Housing Development

Public Housing

Between 1950 and 1975, growth in the City of Taipei was steady and relatively slow. During the economic boom of the last 20 years, the island has seen over half its population move to the metropolitan areas of Taipei, Kaohsiung, and Taichung.¹⁰ In short, the rise of housing prices and the shortage of supply requires the Taipei Municipal Government to intervene. Nine urban development measures were mandated by former Premier Kiang Chen-Kuo in 1973, to strengthen housing construction as one of the mechanisms for “social stability, prosperity, and the creation of employment opportunities.”¹¹ From 1976 to 1989, 33,700 units were built by the city of Taipei, or about 0.65% of all housing units completed in that time. There is still a shortfall of 50,000 units, however, for low-income families on the Housing Department waiting list.

Housing design uses standardized unit floor areas: 12, 16, 20, 24, and 28 ping

(1 ping equals 3.3 square meters). 24 and 28 ping units are the most common. For Taipei, these unit sizes are considerably lower than the average of 107 square meters per unit. In the past, all government housing projects were under the supervision and management of Branch Offices of the Housing Department. Due to the strain on government resources, Resident Committees have been called upon to alleviate some of the burden of a centralized management system. Eventually, Resident Committees will receive all of the management and maintenance responsibilities.

Urban Design

Urban design is a relatively new idea in Taiwan. In 1981, the City of Taipei promoted the plan of Hsinyi Special Zoning District which determined land use zoning, intensity control, the open space system, landscape design, and the transportation system. The city government created the Urban Design Committee to oversee the regulation of the building construction, public works, and landscape design as well as other relevant issues for the whole city.

Among the projects initiated by the City of Taipei is the Chungshan Art District comprised of 20 hectares of land now owned by the Taiwan Tobacco Monopoly just north of the Sun Yat Sen Memorial. This district is meant to be a magnet for cultural activities and will be developed into "a multimedia facility to become the cultural, art and information communication center for the city."¹² The second notable project, also within a kilometer of the Sung Shan Riverfront District, is the Hsinyi Special Zoning District. This district is planned to become the "new role for the city government center, sub-commercial center and model

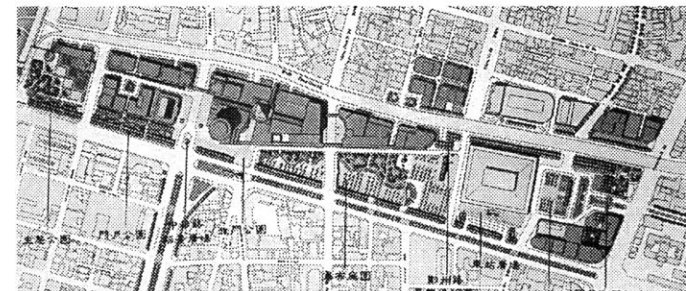


Fig. 2-20 Public Housing Projects Contain Kindergartens and Other Amenities

Fig. 2-21 Sign Beautification Initiative by the Department of Urban Design



Fig. 2-22 Taipei Main Train Station Development



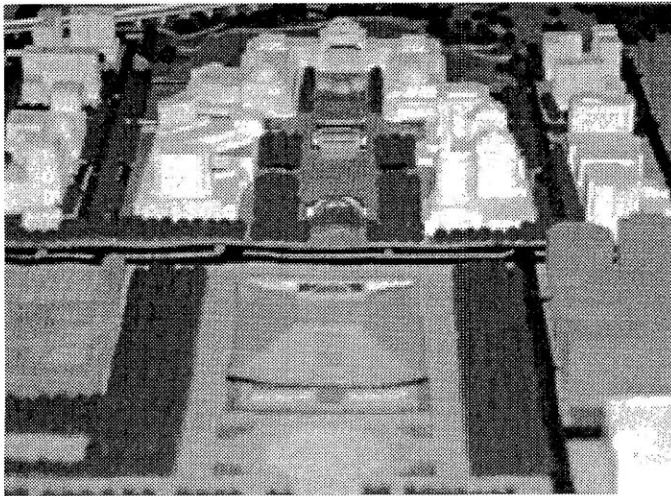
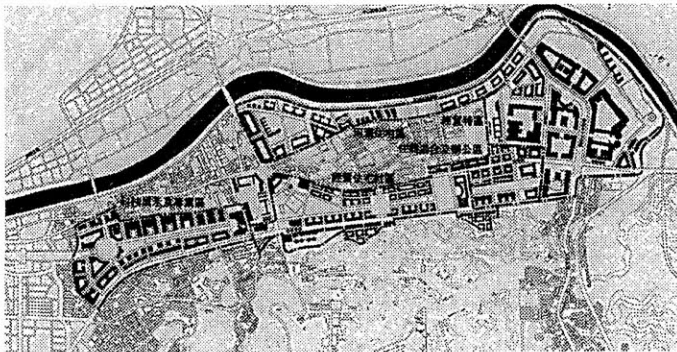


Fig. 2-23 Department of Urban Development Proposal for Chung Shan Cultural District

Fig. 2-24 Nankang District Proposal (Riverfront District is at Western Edge of Plan)



residential zone.”¹³ This special zoning district comprises 153 hectares, including an existing World Trade Center and Exposition Center. These projects will make infrastructure demands on the Sung Shan District.

The Urban Design Department has also aggressively formed a development scheme for Nankang District, the District to the immediate east of the Sung Shan District. This plan was generated in response to the plan by the Taiwan Railway Authority to depress its tracks within most of Taipei proper and parts east. These measures create an urban structure to capture the eastward growth of the City of Taipei. The zoning plan for the western portion of Nankang District specifies manufacturing and industrial uses mainly north of the train tracks. Only two smaller areas are zoned for commercial uses, including the riverfront immediately to the east of the Sung Shan Riverfront District. To the south of the train tracks are extensions of the existing residential fabric currently in the Sung Shan District, across Chunghsiao Road toward the mountains. Another residential zone and light commercial area lies amidst the light industrial uses, adjacent to the Riverfront.

Zoning and Land Use

In Taipei, it is not unusual to find commercial and light industrial uses (car repair shops or retail shops) on the ground floor, restaurants on the second floor, and offices and residences intermingling in the floors above. A vertical zoning map of the city, if it existed, would be a patchwork quilt of disparate uses within the same buildings. Apartment dwellers “may find that they are sharing their floor with a cram school, beauty parlor and a trade company office.”¹⁴ Other prob-

lem stems from a lack of a separate category for office use within commercial uses. Housing is also allowed to be converted to other uses. These factors cause a strain on infrastructure built for residential densities.

At a larger scale, however, Taipei land uses follows a logical structure. Commercial uses are concentrated along the major arterial streets in the city. Heights depend on street width. Residential uses occur away from these major arterial streets. Government uses have a strong relationship with Jenai Road, one of the most important east-west streets in the city. Preservation zones protect the natural elements of the city, like the hills to its north, and Keelung River to the east, and, of course, the mountains to the north and south.

The zoning map indicates primary uses in the city; it does not disallow other uses from occurring within the zones. This relaxed rule of use creates one of the most unique and chaotic cities in the world, and perhaps is part of what gives Taipei its character. This character should be preserved and promoted in the future. This regulatory void has created an attitude in which business owners “don’t mind if signboards do not have any integral relationship with the design of the original structure. They don’t mind because advertising means more business. Money matters, not aesthetics.”¹⁵ Other believe that this expression of Taiwan’s capitalist history should be phased out, and that the government should take the lead in creating more specific zoning rules with stiffer penalties for non-compliance.

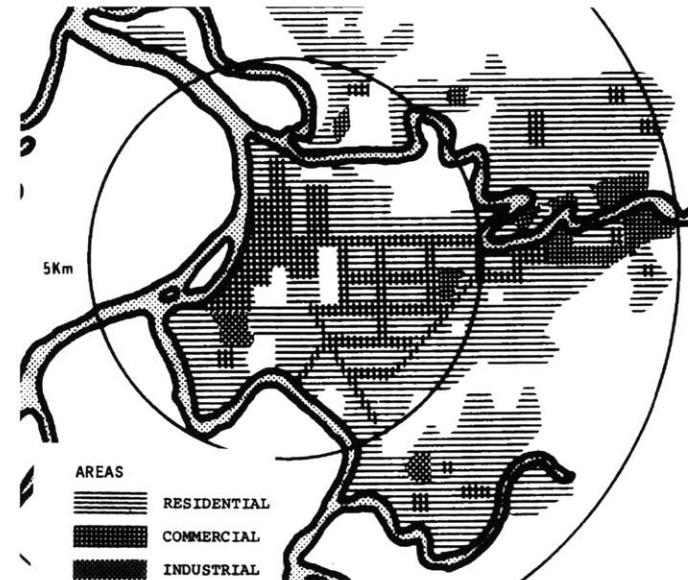


Fig. 2-25 Primary Uses in Taipei

Fig. 2-26 Incompatible Mixed Uses of Housing



- ¹ Department of Transportation, Taipei Municipal Government, *East-West Expressway Location Map*, 1994.
- ² Editorial, "Building Aesthetics" in *Free China Review*, Vol. 45, 4 (April 1995): 1.
- ³ Ezra F. Vogel, *The Four Little Dragons—The Spread of Industrialization in East Asia* (Cambridge, Massachusetts: Harvard University Press, 1991), 40.
- ⁴ Ezra F. Vogel, *The Four Little Dragons—The Spread of Industrialization in East Asia* (Cambridge, Massachusetts: Harvard University Press, 1991), 32.
- ⁵ Ezra F. Vogel, *The Four Little Dragons—The Spread of Industrialization in East Asia* (Cambridge, Massachusetts: Harvard University Press, 1991), 32.
- ⁶ Jim Hwang, "The Search for a Style" in *Free China Review*, Vol. 45, 4 (April 1995): 6.
- ⁷ Jim Hwang, "The Search for a Style" in *Free China Review*, Vol. 45, 4 (April 1995): 9.
- ⁸ Jim Hwang, "The Search for a Style" in *Free China Review*, Vol. 45, 4 (April 1995): 7.
- ⁹ Chin-Oh Chang, *The Operation and Issues of Housing Development in the Public and Private Sectors in Taiwan, Republic of China*, (Department of City and Regional Planning, University of Pennsylvania, 1983), 23.
- ¹⁰ Ezra F. Vogel, *The Four Little Dragons—The Spread of Industrialization in East Asia* (Cambridge, Massachusetts: Harvard University Press, 1991), 39.
- ¹¹ Department of Housing, Taipei Municipal Government, *Taipei Housing: 1986-1989*, 1990, p 12.
- ¹² Department of Urban Design, Taipei Municipal Government, *The General Scope of Urban Design in City of Taipei*, 1993, p 2.
- ¹³ Department of Urban Design, Taipei Municipal Government, *The General Scope of Urban Design in City of Taipei*, 1993, p 2.
- ¹⁴ Editorial, "Building Aesthetics" in *Free China Review*, Vol. 45, 4 (April 1995): 1.
- ¹⁵ Jim Hwang, "The Search for a Style" in *Free China Review*, Vol. 45, 4 (April 1995): 9.

III. SUNG SHAN DISTRICT AND THE RIVERFRONT SITE

Physical Context

Sung Shan District, in eastern Taipei, is one of the newest districts in Taipei. It is defined by Sung Shan Airport to the north, which was converted from an international airport to a domestic one upon the completion of the Chiang Kai Shek International Airport outside of Taipei. Its eastern border is the Keelung River and Nankang District. Nankang District is an growing light industrial and manufacturing area, poised to attract new eastward expansion of the city. Chunghsiao East Road marks the south edge and abuts Hsinyi District, the site of the new Taipei City Hall and the Special Development District. Western Sung Shan District blends into the grid system of Taipei.

Sung Shan District has some of the busiest commercial streets in Taipei. The "People's Streets"—Minchuan, Minsheng, Nanking, and Chunghsiao Roads contribute a large portion of the district's character. They are the streets that give the city its commercial face. Currently, many of Taiwan's television and communications companies are in the district, huddled around the Sung Shan Tobacco Factory (This piece of land is ripe for redevelopment and will be shaped into a new and important cultural facility for all of Taipei.) The railyards belonging to the Taiwan Railway Bureau is another piece of land destined for redevelopment. East of Keelung Road, Sung Shan District becomes primarily residential, with occasional areas of light manufacturing such as the garment district near the Sung Shan Train Station.

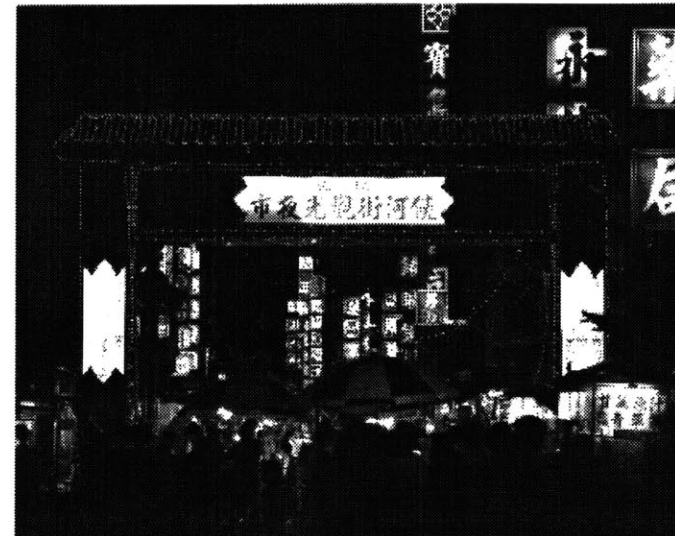


Fig. 3-1 Gate of Jaoho Night Market Street in Sung Shan District

Table 1 Projected Growth in Sung Shan District

Year	Residential (Persons)	Employment (Jobs)	House- holds
1994	186,000	310,000	13,500
1990-2010	236,500	403,000	64,000
2010-2030	300,500	520,000	82,000
2030-2050	381,500	671,000	104,500

Source: Enclave City Study, Taipei Urban Design Studio, Fall 1994.
Note: Riverfront District currently has 1,300 housing units.

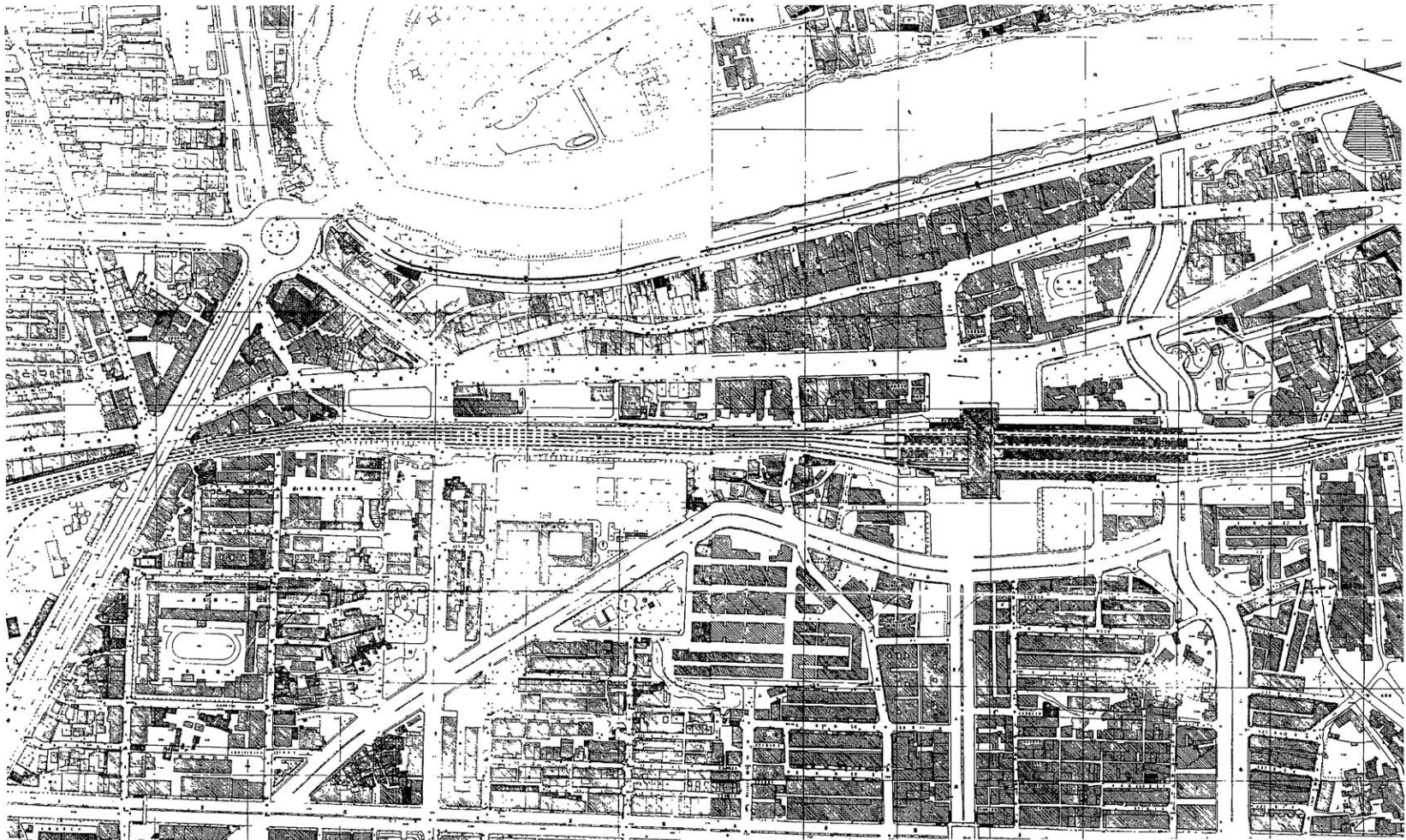


Fig. 3-2 Plan of Sung Shan District around the Study Area

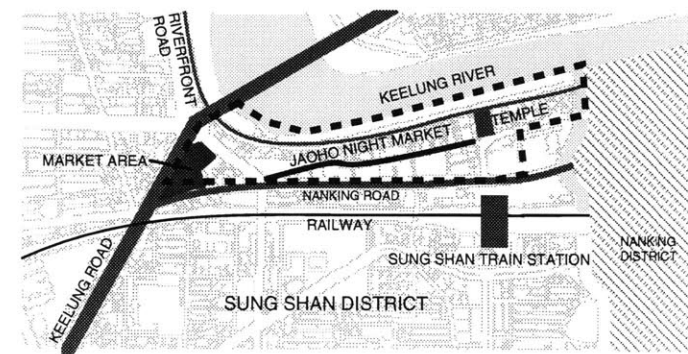


Fig. 3-3 Keelung Traffic Circle and River at the West End of the Site

The Sung Shan Riverfront Study Site is a small parcel at the east end of Sung Shan District. It lies just south of Keelung River, and is bordered by Keelung Road on its west. Keelung is a major arterial road for Taipei that links the eastern end of the city with Keelung, on the coast of Taiwan. Nankang District defines the site's east edge. Nankang Road, a 30-meter road carrying localized traffic from Sung Shan District, runs along its southern edge. Residences have been built in the Sung Shan Riverfront District area over the last 40 years. Non-residential functions are consolidated in the western end of the site. Light manufacturing lies along Keelung Road, and the Jaoho Night Market uses is along Jaoho Street.

The Jaoho Night Market, one of the newest markets in Taipei, is part of this unique character of the Sung Shan District. The 500 meter long street, divided into three sections is fronted by stores with a small, traditional riverfront scale, selling goods which vary from food and folk art to clothing. The eastern sec-

Fig. 3-4 The Sung Shan Riverfront District Defined



tion begins in front of the Tzuyu Temple near Sung Shan Train Station with about 100 stands selling clothing, fruit and toys. This symbiotic relationship gives the market more prestige and patronage, and people can pray and shop on the same street. The western section has about 40 food vendors. In the center section there are Chinese folk artists producing dough and sugar-candy sculpture, macramé, calligraphy, and Chinese paper-cutting. Upper floors of the buildings are used for housing, usually of the working class of the area.

Another important landmark in the area is the Tzuyu Temple. Its presence has been a centerpiece for the surrounding area that has helped to anchor the Jaoho Street Night Market. There is a remarkable view corridor from the Temple towards the south along Sung Shan Road. This corridor contrasts several high-rises against the deep green of the mountains of Taipei.

Fig. 3-5 View of Sung Shan Temple from Train Station



Many of the public spaces in Sung Shan District are shared with or part of educational institutions. School grounds are popular places for older people to practice Tai Chi or other martial arts. Often neighborhood amenities are located near educational institutions to facilitate supervision and maintenance. One example is the swimming pool next to Sung Shan Junior High School. Sung Shan Elementary School, the only school in the Riverfront Design Site, sits to the immediate east of the Sung Shan Temple. Another notable public spaces is a plaza at Sung Shan Train Station. This space suffers from being open and is used for motor scooter parking, which leaves little room for people to congregate. In the summer, this plaza is dangerously hot without plantings or other coverings. Redevelopment of the station would provide better open spaces in this area.

The northeastern area of Sung Shan District and part of the Riverfront Design Site borders on the Keelung River Preservation Zones. These zones are the flood plains for the river during the rainy season. Flood walls and flood plains along the river help protect the inhabitants of Taipei from seasonal flooding. The river and its tributaries has shaped the road system in Sung Shan District. Sung Lung Road follows a large tributary of Keelung River, which accounts for its windy, diagonal path across the grid of the city. Between Keelung and Sung Shan Roads, there are several chains of green open spaces that follow the path of old streams. There is also a band of trees next to the levee wall. Residents park their cars under the trees, a habit which leaves little space for sitting and enjoying the shade. These green spaces have been preserved aggressively by the City of Taipei, for possible reclamation in the future.



Fig. 3-6 *Flood Wall Along Keelung River*

Fig. 3-7 *Trees and Parking along Riverfront Road*



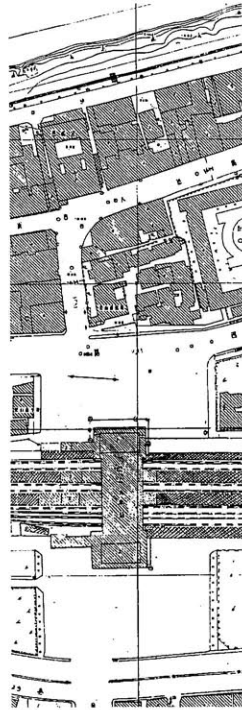
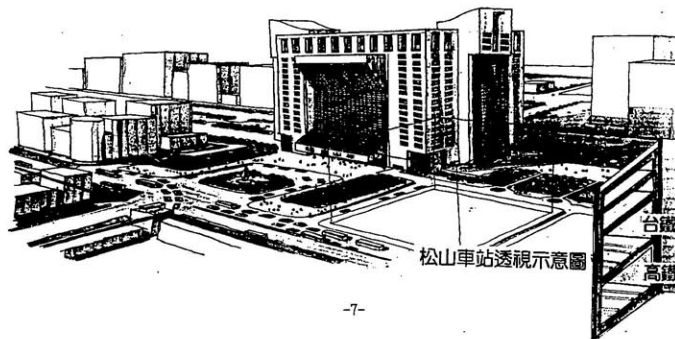


Fig. 3-8 Plan of Sung Shan Train Station South of the Temple

Fig. 3-9 Train Station Redevelopment as Proposed by the City Government



Trends in Sung Shan District

Sung Shan Riverfront District is a reflection of the growth and replacement trend taking place in the rest of Taiwan. The Riverfront Site provides housing for the farming and manufacturing areas in Sung Shan District before the growth eastward of Taipei City. It was once a riverport that specialized in garment and produce trading and served the populations along the coastline to the north-east of the capital city of Taipei. Growth boomed from the train station southward. The district, also known for its brick-making, houses the working class who live and worked in its various garment, automotive, or rail-related shops. The area is a balanced between affordability and gentrification.

The Sung Shan Train Station area is close to shipping facilities and industrial manufacturing zones in the bordering Nankang District. The proximity to these amenities and services is attractive to businesses. Taking advantage of reasonable rents, the electronics industry has begun to tap into this area, and manufacturing plants are locating in the adjacent Nankang District. The challenge remains to retain a certain level of affordability of housing for the working class, while preserving and promoting the area's unique character.

The planned redevelopment of the Sung Shan Train Station and the addition of subway lines in the Sung Shan District create the opportunity to tie the study site into a network of important public spaces that run from Old Taipei to Nankang District. The new station will serve commuters living east of Taipei. The station will also be the junction point of the commuter line and a subway line, and could serve as the catalyst to form a new, viable commercial subcenter outside of

downtown Taipei. Whereas fifty years ago its livelihood depended on the river, the future Sung Shan District will derive its energy from the rail systems.

The new vision for Sung Shan Train Station by the city government is a box-like mixed-used building with 16 floors, 130,000 square meters of floor space and 1,700 parking spaces. The plan addresses new uses for the available land, traffic, and preservation of the surrounding areas within a strong growth scenario. The zoning also aggressively targets a commercial core around the train station and funnels industrial uses towards Nankang District.

Urban Design Impacts

An elevated expressway will be built between the railyards and the Chungshan Art District, where it will take a 45 degree bend towards the northeast along Keelung Road. This elevated structure is likely to create an unfriendly street condition at Keelung Road and may cause new buildings to face away from this arterial road. The expressway will have an off-ramp at Yung Chi Road, which serves eastern end of Sung Shan District. The increase access in the district may indirectly cause congestion in Riverfront Study Site. The addition of this new expressway is another factor in the growth in the Sung Shan District and reinforces the need to examine the increase of housing density along its riverfront.

The impact of these urban design plans and the redevelopment of the Sung Shan Train Station will be felt on the Sung Shan Riverfront District. As a commuter rail and subway stop and a major stop, the train station area will attract

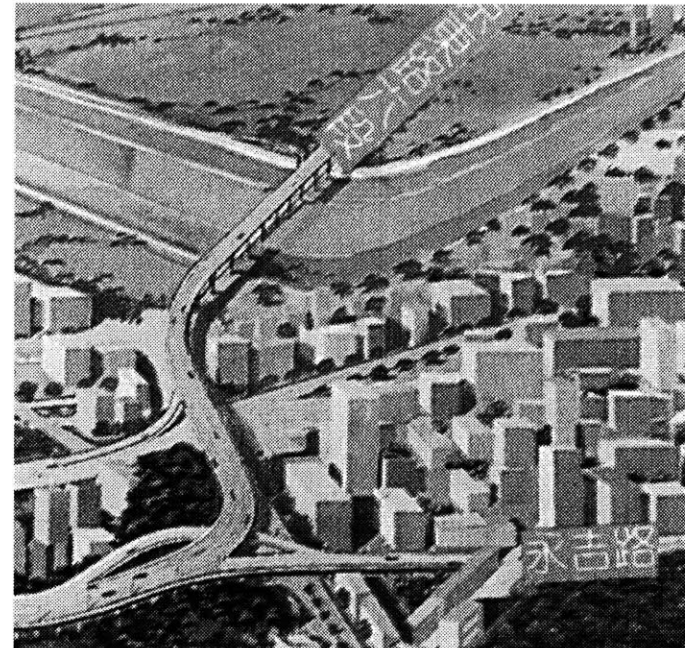


Fig. 3-10 Expressway Forms an Edge at Keelung Road

Fig. 3-11 Traffic on the Ground at Keelung Traffic Circle



new commercial enterprises, as well as become a collection and dispersal point for the activities in the Chungshan Art District and the Hsinyi Special Zoning District. The City Government has addressed the urban design considerations for the Sung Shan Riverfront District in documents like the Railway Depression Study, but detailed plans to deal with the river's edge have yet to be written.

In any new development of the train station area, transportation infrastructure must be responsive to the new loads of bus, passenger and pedestrian demands in this area. Meaningful views and structures must be maintained, such as the Sung Shan Temple and Jaoho Night Market Street. New pedestrian zones must also be added that use the air-rights at the train station and the newly landscaped riverfront.

IV. THE VISION FOR THE RIVERFRONT SITE

GOALS

The proposed design responds to transportation nodes at both ends of the site. A new commercial and shopping area will develop around the Sung Shan Train Station, and the demand on space would likely impact the Sung Shan Temple area. The MRT node at the western end of the Sung Shan Riverfront District would require large spaces in which transit users could gather and disperse. Because of the East-West Expressway barrier along Keelung Road, this end of the site could become a high-density environment connected to the surface streets and the rail system.

Block sizes need to be responsive to the existing urban fabric and accommodate a clear, well-defined and logical traffic system. The proposed development must also be sensitive to the public nature of streets in Taipei. The intensification of Nankang Street for commercial and office uses would provide a strong edge which would help retain the intensity and uses of Jaoho Night Market Street. By building a network to the water; the market would be the one in Taipei connected to the riverfront. Whether the Night Market can survive redevelopment is an important question. It is possible that the importance of Jaoho Street is reduced in order to emphasize the riverfront and create a new urban infrastructure. Regardless, new development should aim to create a rich public realm without the need to replicate old ones.

The river's role in the development of a richer urban environment has been

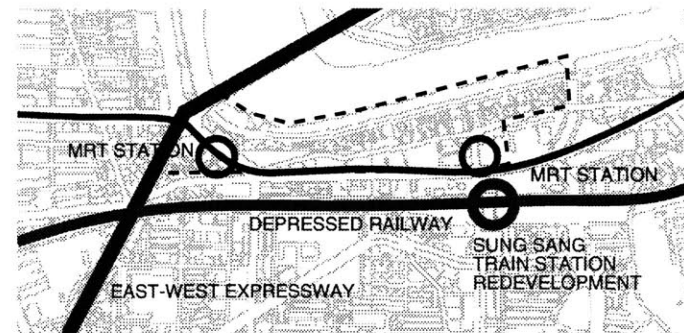
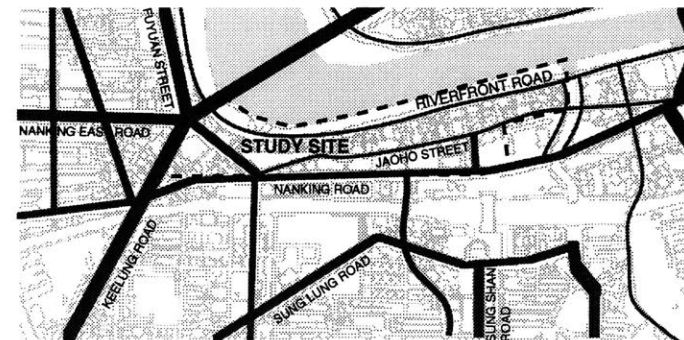


Fig. 4-1 Planned Mass Transportation Stations in Design Site

Fig. 4-2 Street Infrastructure in Sung Shan District



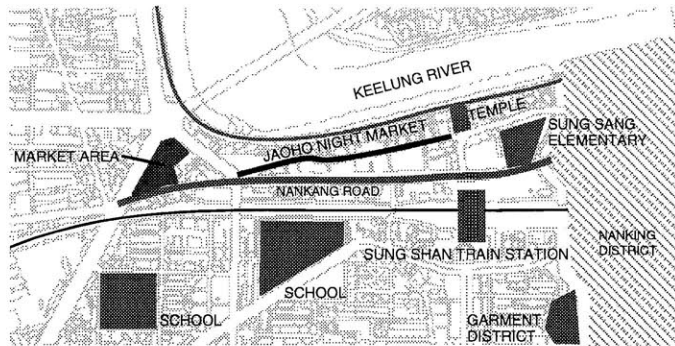


Fig. 4-3 Public Spaces in the Riverfront District

largely ignored until recently. Landscaping is now being created during the construction of concrete riverbanks to provide access to riverfront recreation areas. These projects follow in the footsteps of other programs to detoxify and cleanup the various rivers in Taipei. The challenge is to integrate the river with its urban surroundings while maintaining the same level of safety and protections from the flood waters.

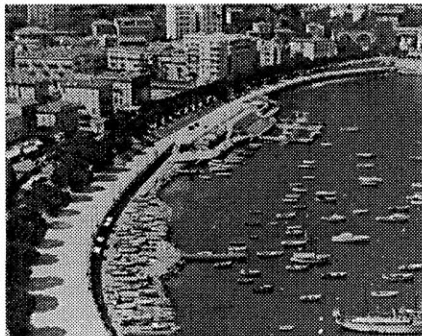
New housing in the redevelopment district should be sensitive to the existing makeup of inhabitants. Displacement as a result of rising real estate values should be prevented as much as possible. Market-rate housing and commercial spaces in the redevelopment should help pay for enough affordable units to house the existing occupants of the site.

Manipulation of City Form

Kevin Lynch states in *The Image of the City* that "in actual design form should be used to reinforce meaning and not to negate it."¹ He identifies five types of elements as contributors to the image of the city: paths, edges, districts, nodes and landmarks. This vision interweaves many of these elements into a more coherent whole. Currently these elements on the site are distinct and not integrated: Jaoho Night Market Street is a path; the riverfront flood wall is an edge; the current site is not yet a coherent district, and Sung Shan Temple is not yet a clear node or a landmark.

This design proposal uses a network of pedestrian paths to "stitch" the riverfront together with the housing district. A new path along the river recaptures the

Fig. 4-4 Waterfront Area in Nice, France
Fig. 4-5 Creating Experiences Along a Path (from Kevin Lynch, *Image of the City*)



riverfront for public use. This riverside path will define the visual and use hierarchy of the network in the district.

The city fabric in the Sung Shan Riverfront District is a single fine-grained fabric made up of the individual buildings on the site. The new vision weaves larger grains with this finer grain in order to establish a richer relationship with the river. The intention is to create a district with a variety of spaces, nodes and landmarks.

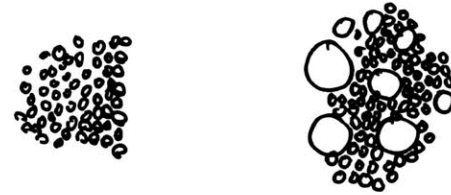


Fig. 4-6

Modification from Single-grained to Multi-grained City Fabric

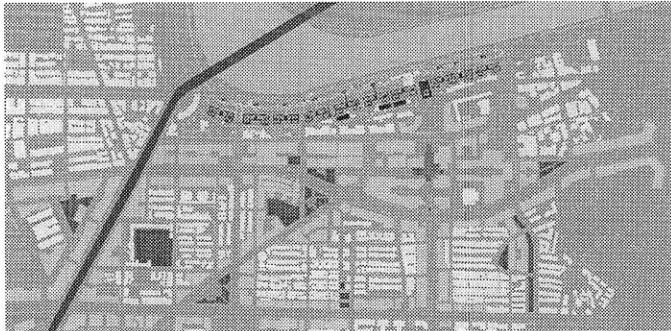
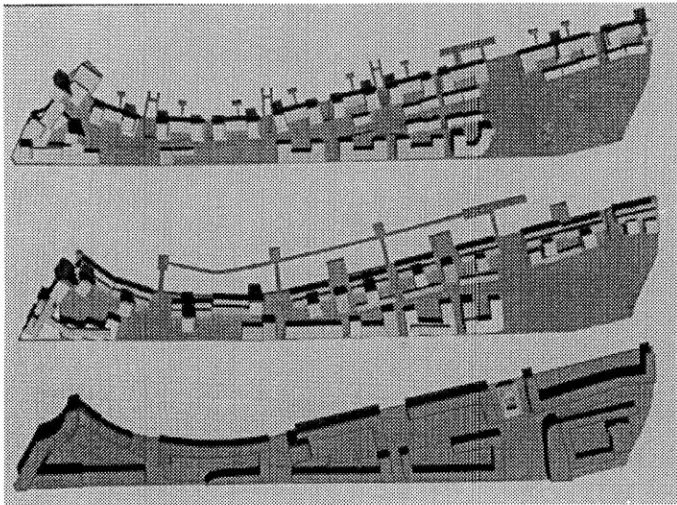


Fig. 4-7 *Rendered Plan of the New Vision for the Riverfront District*

Fig. 4-8 *Creation of Enclaves Within Three Earlier Schemes*



DESIGN CONCEPT

The Enclave City proposal, developed in a team effort during the Taipei Urban Design Studio in the fall of 1994, provides a framework for the design of the site. Enclave City examines the city's fabric and identifies two development patterns: residential and non-residential. The **enclave** is a residential unit made up of individual neighborhoods and framed by the larger arterial streets of Taipei. On its edges are commercial uses, usually targeted at city-wide and sometimes regional markets. Office buildings and higher-class hotels are located on this periphery. Residential uses and neighborhood commercial activities make up the core of the enclave. There are also zones for other uses such as schools, light industry and manufacturing. These uses, however, tend to serve the enclave and more local markets unlike the commercial uses around the edges of the enclave.

Other spaces which do not fall under the rubric of enclave are public spaces or private properties such as the railyards and Taiwan Tobacco Monopoly properties in the Sung Shan District. The Enclave City design proposal investigates the opportunities for turning some of these spaces into either public zones or enclaves.

Enclave City investigates ways to clarify the hierarchy of streets and spaces in Taipei by reinforcing the idea of the residential unit. By defining stronger edges on a grid system and rerouting streets, Enclave City provides a better traffic distribution system as well as a clearer diagram of pieces of the city. This thesis uses this framework to design for the study site as an enclave.

Tools

The redevelopment of the Sung Shan Train Station area will change the urban form of the area. Designers should capture and develop the special opportunities in the area presented by this project. The urban design proposals developed in this thesis are based upon the following design guidelines which promote a vision for the Sung Shan Riverfront District:

- Form strong connections to the riverfront
- Establish a pedestrian-friendly environment and provide more public spaces
- Create and preserve amenities within a high-density development
- Integrate new development with the existing urban context

The Sung Shan Riverfront District is envisioned as a new high-density residential area along the river, embraced by several new public spaces. The vision builds on the new mass transportation changes in this portion of Sung Shan District. Other organizing concepts for the Riverfront Study Area include:

- High Density Commercial Nodes around the new MRT Stations at the Temple and Keelung Market Sites
- High Density Housing Core between these commercial nodes that employs a new building type
- Coordinated second story deck that creates a new pedestrian network connecting these nodes, the housing, and the riverfront
- Intensification of commercial uses along Nankang Road

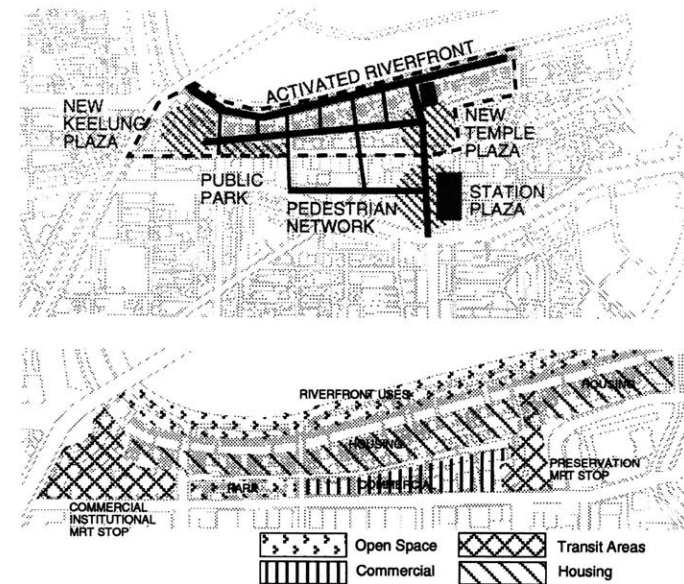


Fig. 4-9 Diagrams of the Vision for the Study District

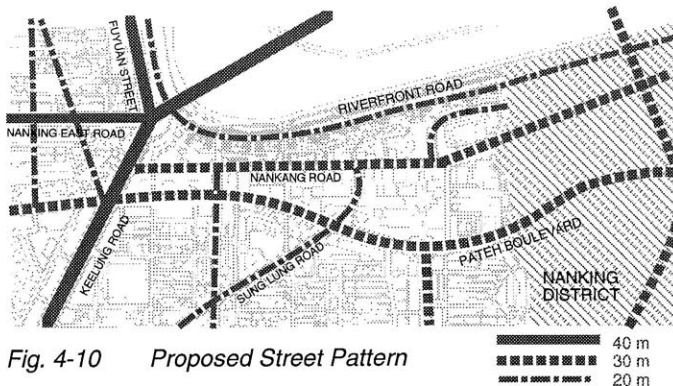
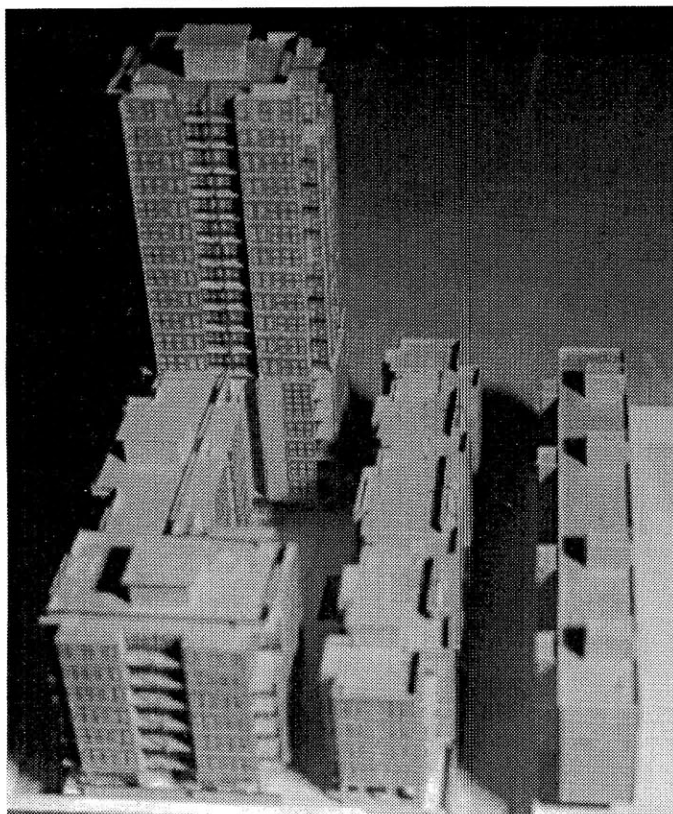


Fig. 4-10 Proposed Street Pattern

Fig. 4-11 Courtyard Housing Prototype for the Riverfront District



Transportation Impacts

The impact of the new transportation infrastructure proposed for this area is the biggest reason to examine the redevelopment of this section of the city. The design shapes a high density commercial node around the Sung Shan Train Station, the Keelung Market area and the Sung Shan Temple. These commercial nodes embrace and define a housing area and consolidate development away from the housing core. Redevelopment is envisioned at a block scale to create the best possible urban conditions.

The commercial nodes around the new transportation infrastructure can support pedestrian networks at grade or above. Commercial development could activate the riverfront closest to these nodes. Commercial and retail should continue along Nankang, with even higher density to create a strong street wall. Unhealthy uses should be moved off the riverfront site. Parking occurs in the underground levels of most developments. Surplus parking can be built into housing developments for commuter traffic. The balance of the riverfront is left for recreation or other uses.

Housing Core

The design approach for the housing core emerged from a careful analysis of the existing site to determine the current FAR and uses. Doubling of the FAR is necessary to provide enough economic incentive for developers and landowners to develop the site. (There are, however, environmental impacts that must be considered along with simple economics.) This became the aim for the

overall FAR of the site: to increase from FAR from 3.5 to 6 or 7. A costing model for the housing design is presented in Appendix C.

At least 3.5 FAR would be reserved to house current tenants. This requirement encouraged the exploration of a building type which combined both public and market rate housing in a base with towers. The base retains the existing FAR of each site; while the towers would add market-rate housing and create the added incentive for development. Market-rate housing floors could be traded among sites to create taller towers in some areas, and preserve the roof of the base for amenities or sky lobbies in other areas. These new buildings would also be connected at many levels.

The building type also retains the edge of the Jaoho Night Market Street wherever possible. Jaoho Street retains the density and use of the market street. The new building type provides a network of open spaces away from the street at a higher level.

Public Spaces and Landmarks

A new necklace of public plazas is envisioned for the eastern portion of Sung Shan District. The new Sung Shan Train Station will have an active plaza in front which would be visually and physically connected to the mountains to the south with a corridor along Sung Shan Road. In addition to the current Jaoho Market Street, the design features four new public spaces. Two new public plazas are linked to the MRT stations. Keelung Plaza is a high-density commercial and institutional use area, with spaces that require large floor plates on

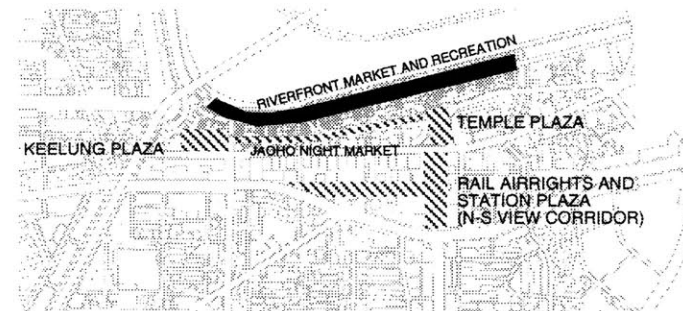


Fig. 4-12 Proposed Open Spaces

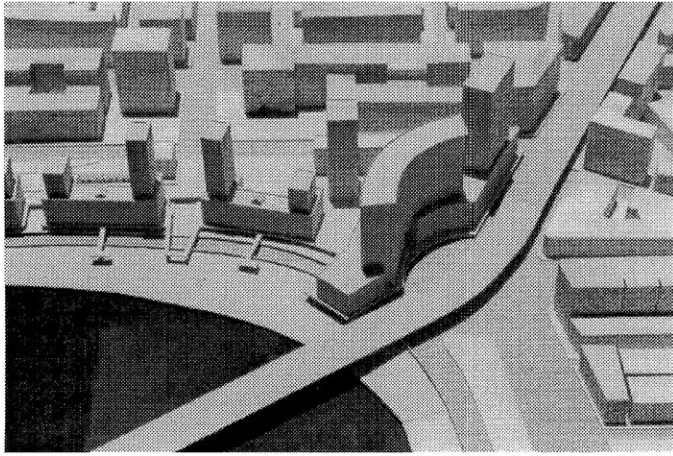
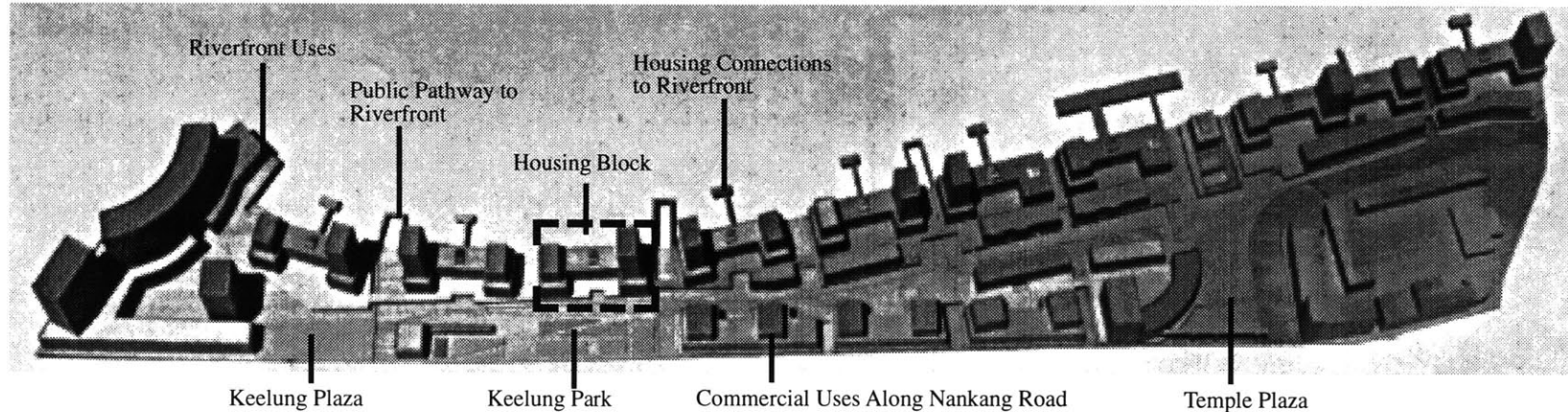


Fig. 4-13 Keelung Plaza and Adjoining Park

the Keelung Street edge. The Temple Plaza is a lower density area with commercial uses linked to the MRT station. Tokyo subway node developments, such as Shibuya and Shinjuku, are good models for development.

The riverfront becomes a new public space. Its ends are defined by commercial uses which are linked to each of the plazas. A new park occurs at the western end of the Jaoho Night Market Street, where the area between the street and Nankang Road create difficult geometries and small sites. At this location, the night market street is shifted north to provide a small urban park close to Keelung Plaza and create a richer street environment.

DESIGN DESCRIPTION



Program

The new vision for the Sung Shan Riverfront District proposes a more rigid zoning plan with clearly separated uses, and may require the status of a Special Development Zone. Compared to the existing zoning map which regards the whole Riverfront District as a commercial zone, the new zoning is much more descriptive. Keelung and Temple Plazas are mostly commercial (more than 90%), with some luxury housing and hotels. Roughly 4,000 square meters east of Keelung Plaza is set aside for a public park, and the rest of the study site is primarily residential, with only 1 FAR out of 7 used for commercial enterprises.

Vertical zoning is also much more rigid in the new vision for the site. Commercial uses within residential zones are not allowed above the second floor, except in the buildings contiguous to Keelung and Temple Plaza. The proposed uses for these commercial spaces are more clearly defined later in this docu-

Fig. 4-14 The Riverfront Design Site

Table 2 Program Summary

	Existing	Proposed Site	Proposed Residential Block
USES			
Retail/Commercial (sq.m)	56,000	203,400	3,840
Residential (sq.m)	130,000	197,000	14,080
(units)	1,300	2,290	164
Parking (spaces)	475	3,340	150
Open Space (sq.m)	0	25,000	1,000
FAR	3.5	6.0	6.6

Notes: Total Site Area = 79,200 square meters

1 FAR of existing site is assumed commercial/retail and the balance is residential

Number of parking spaces (single side parking) calculated with formula:

road length in site / 4 meters per car

1 parking space / 100 square meters of commercial development

.5 to 1 parking space per unit of new housing

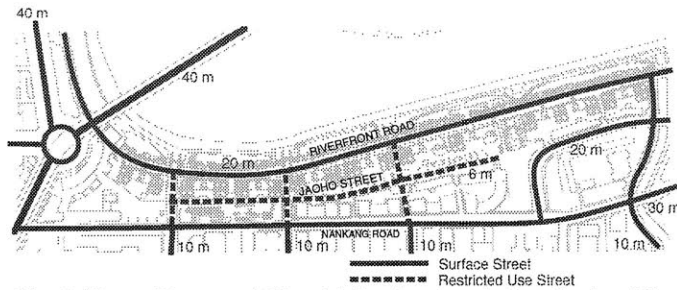
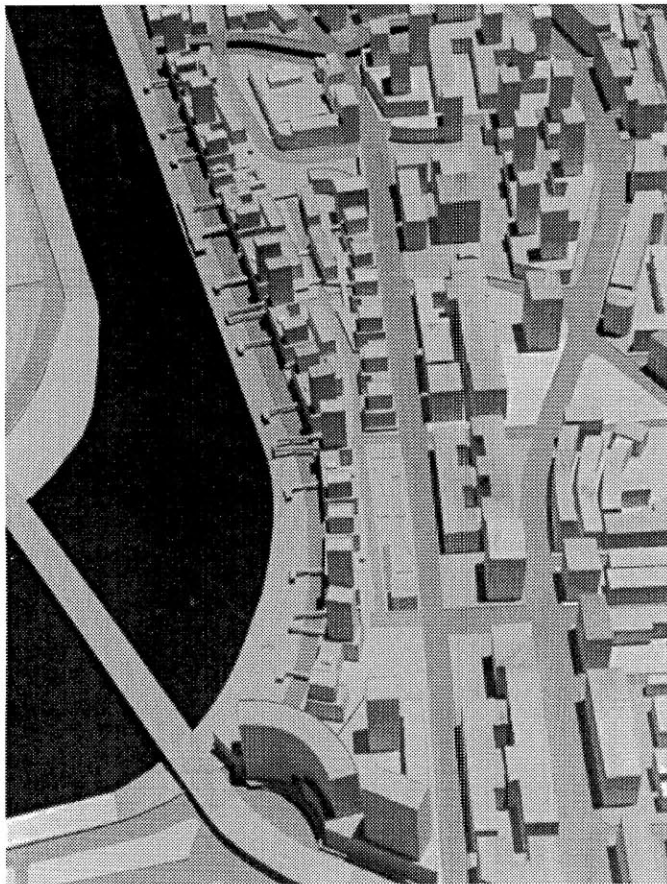


Fig. 4-15 Proposed Street Infrastructure in the Design Site

Fig. 4-16 Propsed Riverfront District from the West



ment. These commercial floor areas may be traded among the sites to allow the buildings to be more responsive to the context.

Parking on the site is also more tightly controlled. Parking is prohibited on most of the surface streets. The new housing redevelopment is required to have at least 0.5 parking spaces per public housing unit, and one space per unit of market housing. Public transportation is encouraged for commercial uses with a parking requirement of one space per 100 square meters of development. Motorcycle and scooter parking is provided at grade, at one space per housing unit.

Street Infrastructure within Sung Shan District

The new important edge-defining street for the Train Station Enclave is the redirected Patch Road, which now merges onto Sunglung Road roughly 300 meters east of Keelung Road. This 30 meter wide road becomes a new important East-West Boulevard for the city and connects to Sung Shan Train Station. Nankang Road, which parallels the railroad tracks is a major commercial at 30 meters wide. In this scheme, Nankang Road would terminate at Keelung Road and continue into Nankang District to the east.

The intention is to create a high density edge which protects a residential core. The strong commercial edge occurs at Patch Road south of the train station and has an FAR of 8 to 10. The intensity of commercial uses diminishes northward from this edge. The most intense core residential use zones occurs at the river's edge.

The western edge of the Riverfront District is Keelung Road. This road is the major north-south arterial for eastern Taipei. An elevated expressway planned along Keelung forms an even more formidable boundary for future developments. At grade, Keelung feeds into the Riverfront Road along the river. This road (currently 10 meters wide) will have to carry even more traffic once the area is developed. It is possible to build a road 12 to 14 meters wide if the planting zone next to the flood wall is eliminated. A more ecologically sound solution is to regulate easement control using part of the ground floor of developments for streets. This Riverfront Road would then become the service and access road to the new commercial and residential buildings north of Jaoho Night Market Street. (Nankang Road will service the buildings to the south of the night market street.) Jaoho Street will be primarily pedestrian-only. It will remain six meters wide, and some shops may be serviced from this street on a time-restricted basis. The north-south streets within the Riverfront Site will be also have restricted vehicular traffic.

Pedestrian Infrastructure and the Riverfront

With new MRT and commuter rail stations, the Riverfront District must prepare for a large influx of pedestrians at different times of day. Roadways in the area are currently not capable of handling any substantial rises in pedestrian volume. New pedestrian infrastructure allows for larger plazas or transit collection areas, and for more ways to connect to these areas.

New pedestrian infrastructure aims to preserve Jaoho Street and create an activated path along the riverfront itself. A rigorous network of north-south

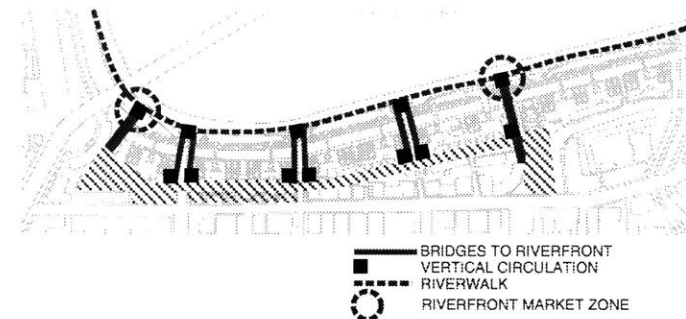


Fig. 4-17 *Public Pedestrian Network*

Fig. 4-18 *Public Path to Riverfront*



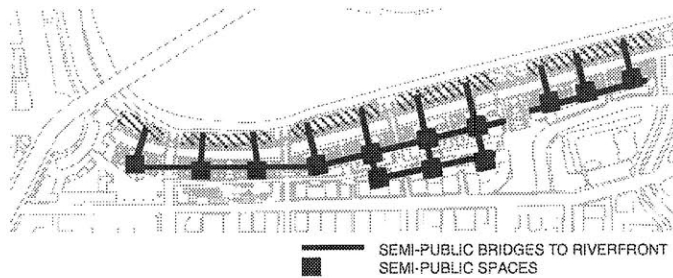
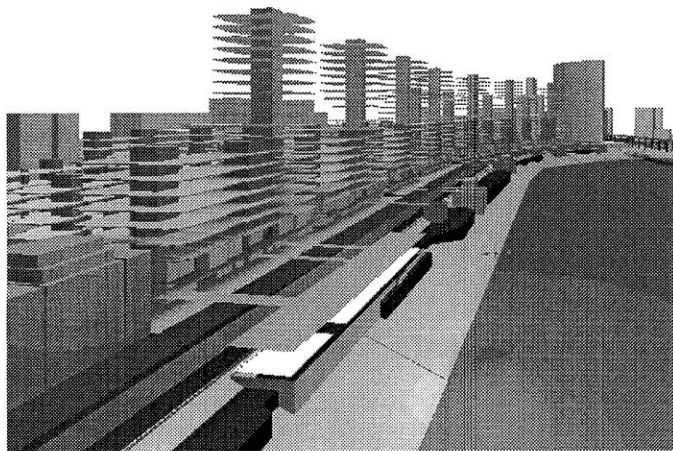
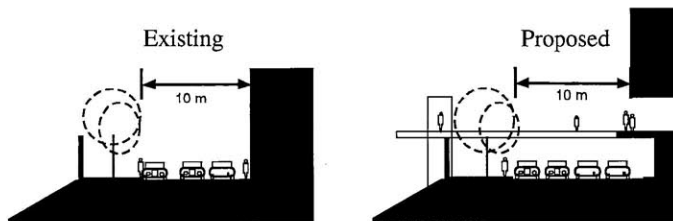


Fig. 4-19 Second Story Pedestrian Network

Fig. 4-20 Pedestrian Network Bridges across Riverfront Road



connections link the river to Nankang Road and areas to the south. Major connections should occur at the “T” junction of the north-south vehicular streets and Riverfront Road, which is approximately every 200 meters. Pedestrian traffic is attracted upwards to cross the 10-foot levee wall and visit recreational areas along the riverfront.

The housing proposed has entrances from many different types of spaces. While the majority of housing fronts Jaoho Street, some new building units have entrances in the interior courtyards. Service entries are along Riverfront Road. The circulation entrances are also accessible from the east and west faces of the blocks along roads or interior paths. As a result, almost everything faces a public space.

At the intersection of Jaoho and the north-south streets, there are block openings to provide visual and spatial connections to the interior courtyards of the new housing. Large stairways at the corners allow gathering and connections to the raised courtyards. At these special intersections there are also above-ground public promenades connected directly to the riverfront.

This design encourages other crossings. The east-west dimension of a typical proposed block is 80 meters. Each block could have its own access to the riverfront, increasing the number of connections. An active riverfront would increase the pedestrian traffic at the first story platform above ground level and make this level a new public realm shared between the development and the general public. A system of FAR bonuses can encourage the development of these aerial connections. Land can be awarded on the riverfront for private

use. The connections would be maintained by each block.

Public Plazas

Public plazas are important to collect and disperse pedestrians and provide entrances to the transit stations. The vision for Sung Shan Riverfront District develops two significant public plazas that have a strong connection to the river. Keelung Market Plaza is a new open space at the western end of the study site. The MRT stop unloads workers into this new high-density district of taller buildings (up to 25 stories) which shield the elevated expressway.

A mix of office and residential buildings surrounding the 3,500 square meter plaza. These buildings are designed to provide a capstone for Nanking Road, one of the most important streets in Taipei. Fuyuan Street also terminates at the edge of the Riverfront Site and forms a traffic circle. A curved building responds to this circle, and the podium for this curved building continues along Nankang Road to provide a street wall until the opening of the plaza. An anchor along the riverfront, the podium also bridges north across Riverfront Road and provides a variety of hotel, entertainment and market uses. Traffic is managed on the streets surrounding the plaza.

To the immediate east of the Keelung Market Plaza, a new green space is developed along Keelung Road as an amenity for the surrounding areas, particularly the high-density commercial zones at Keelung Plaza and on Nankang Road. The traditional entry to Jaoho Night Market Street sits at the northwest corner of the 8,000 square meter park. A building here would recreate the

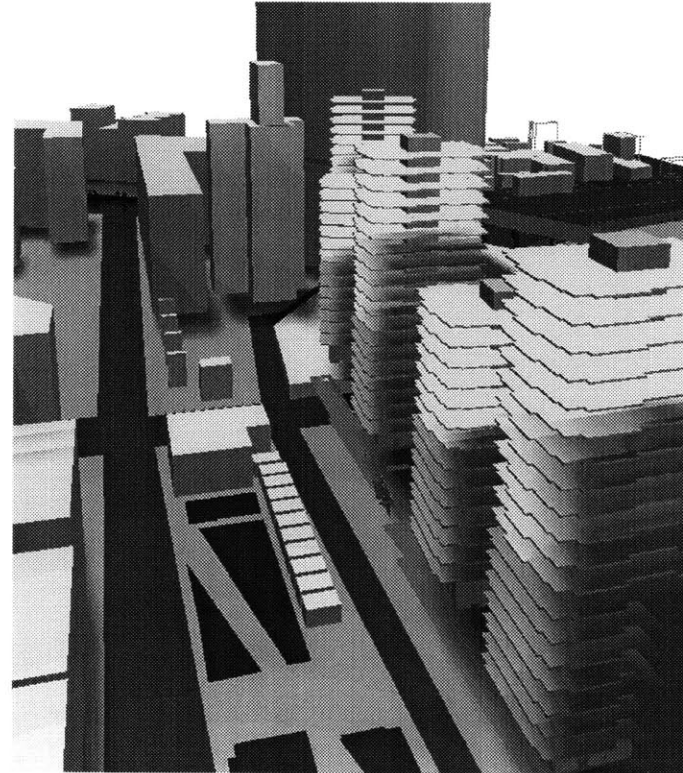
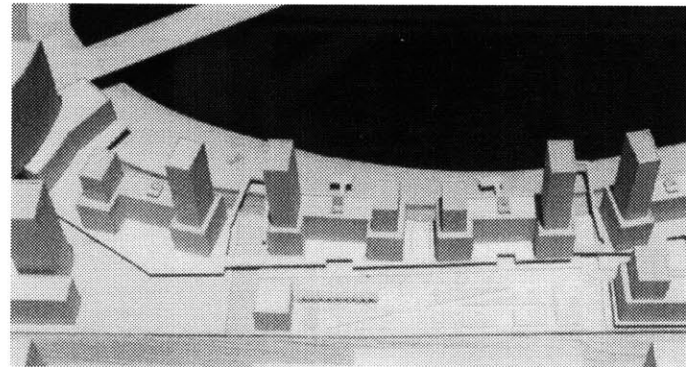


Fig. 4-21 Keelung Plaza and Park Mark Western End of Site

Fig. 4-22 Keelung Plaza from Railway Commercial Development



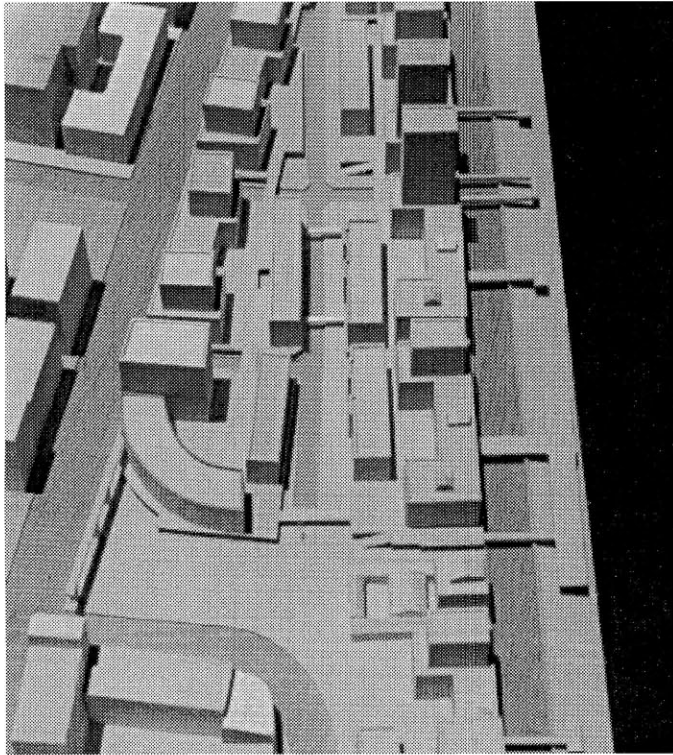
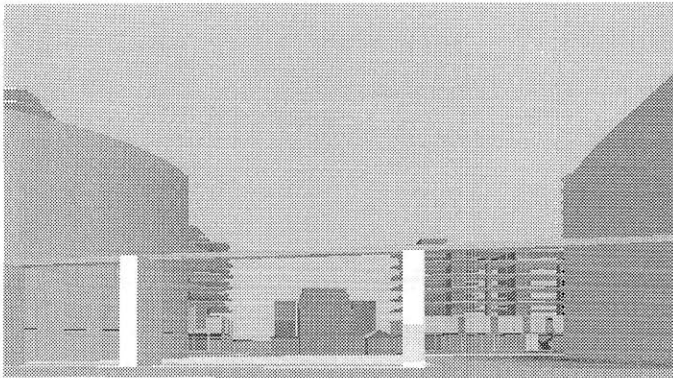


Fig. 4-23 Temple Plaza Terminates Jaoho Night Market Street

Fig. 4-24 Gate at Temple Plaza Creates a Sense of Place



gate. Other small shops serve the lunch and dinner crowds in the area. FAR bonuses is a possible way to fund the development of this park.

The Sung Shan Temple Plaza is the major plaza for the Riverfront District. This plaza terminates an axis which extends from the mountains to the south of Taipei along Sung Shan Road to the train station. As an entry point to an MRT station and the underground plaza for Sung Shan Train Station, the plaza is one of the most important new urban spaces for Taipei. Its centerpiece is Tzuyu Temple, which remains one of the landmarks in the district. The building envelope around the plaza respects the temple and gives it space. A network of pedestrian traverse around the plaza.

Temple Plaza is created by moving the road currently in front of the temple 35 meters to the east through the site of the existing fire station. Currently, there is an intersection directly in front of the temple which is neither pedestrian nor vehicle-friendly. This move creates a 3,500 square meter plaza in front of the temple which is connected to a series of open spaces in front of the Sung Shan Train Station. A combination of department store and MRT station sit at the southwest corner of the plaza. Pedestrian traffic filters upwards to the network of second-story platforms and courtyards which gives Temple Plaza a unique quality. These platforms extend out to a commercial platform on the riverfront that serves as an anchor for new activities.

Entry gates are proposed to mark the south boundary of the Temple Plaza at Nankang Road at grade and the arrival to the historic Sung Shan Riverfront District. Pedestrians can cross at grade, but are also encouraged to cross

under Nankang Road, where there are subterranean connections to the MRT and Sung Shan Train Stations.

The building envelope at the Temple Plaza is respectful of the Tzuyu Temple. Lower scale elements that are not more than seven stories tall frame the six-story temple. Towers are placed far away to preserve privacy in the courtyard spaces of the temples. As viewed from across the river, the rhythm of the residential towers breaks to acknowledge this important piece of architecture.

Open Space and Natural Elements

Each block development has a major courtyard off the street at the second-floor level. These are connected and accessible from the Night Market Street by stairs, and are connected to each other by bridges throughout the whole Riverfront District. These spaces are further connected to the riverfront.

The roofs of the buildings are sources of open space which provides a variety of amenities for the residents. Rooftops are sometimes used for housing.

Nankang Road

The design envisions a stronger street wall along Nankang Road. The building mirror the building prototype proposed for the housing areas and have courtyards that are part of the second-story. The density of commercial uses in these buildings are much higher, and the towers of these buildings are designed to minimize shadow impacts in the residential areas.

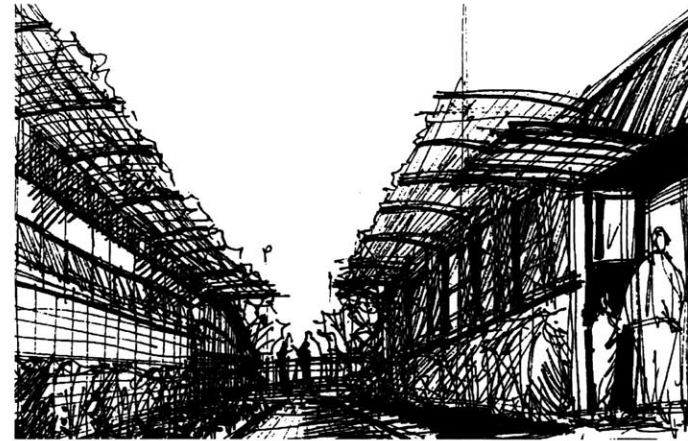
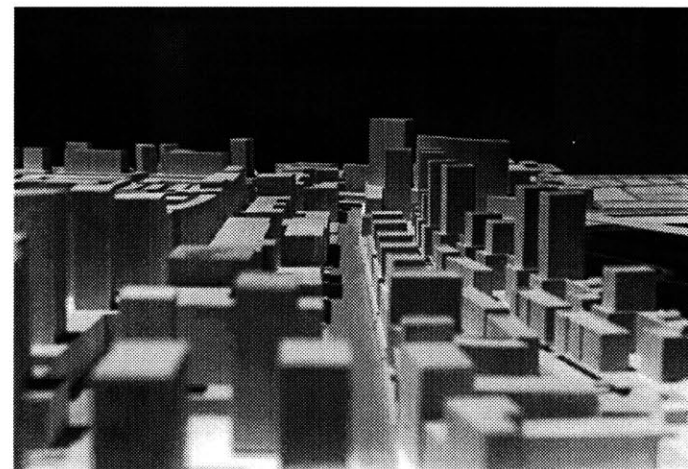


Fig. 4-25 Roof Housing and Amenities are Encouraged

Fig. 4-26 Intensified Nankang Commercial Street Edge



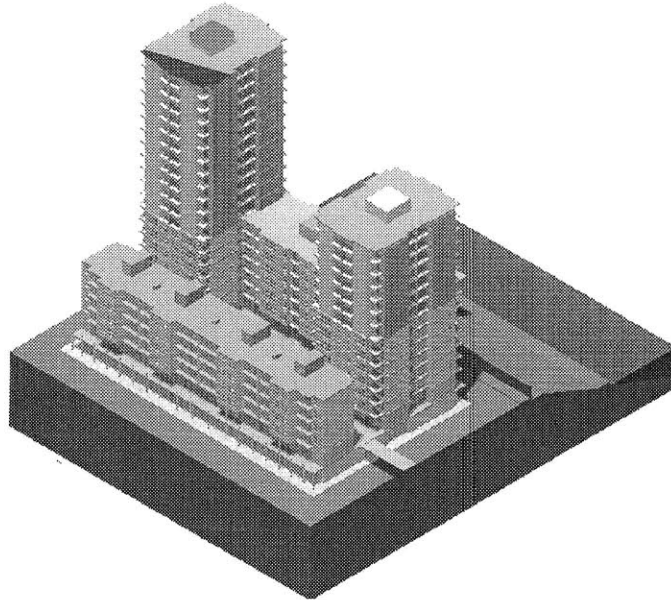
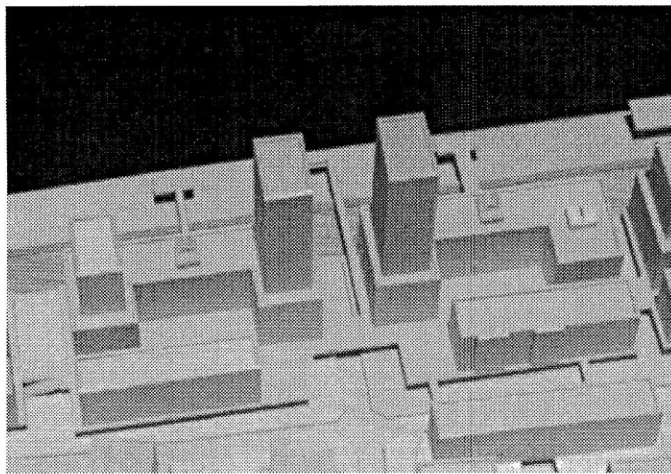


Fig. 4-27 *Proposed Courtyard Housing Type*

Fig. 4-28 *Housing Blocks in the Design Site*



The Architectural Scale: A Housing Type

The housing prototypes proposed for Sung Shan Riverfront District are based on a typical section of Jaoho Street north to the riverfront. These prototypes detail the uses at each level and the layout of each unit. There are two distinct housing types on this typical block of 80 meters east-west and 45 meters north-south. The southern unit is an adaptation of current four-story walkups, transformed to respond to two different conditions: Jaoho Street and an interior courtyard. The northern unit consists of a six-story podium with towers on top, accessed by three core elements. At an FAR of 3.9, the four and six story buildings replace the housing occupied by the current inhabitants of the riverfront district. The towers and new commercial spaces provide the profit of the development. Each floor on a tower is worth FAR 0.13. This is intended to create a flexible system to trade FAR across sites in order to emphasize and celebrate prestigious locations.

The unit within the housing development is flexible. Tenants can order modular bedrooms, studies and kitchens and personalize their housing unit. These kits also include enclosure systems prepared by the residents or condo committees. The basic notion is to encourage variations in spaces and facades in order to avoid the dullness and homogeneity of many public housing projects.

Vertical Zoning

Below Ground. Because of the cost of building underground and the problematic soil structure of riverbanks, the new housing type only has a maximum 2 stories underground. These underground floors are primarily parking spaces, though sometimes they may have commercial spaces connected to shops at grade. Surplus parking spaces can generate revenue for the development.

Grade. The southern edge of the block is reserved for the Night Market Street. The block retains the building rhythm and uses of the existing buildings. These uses usually target a tourist market or replicate the activities of the Night Market. (Each block contributes two meters to Jaoho Street, increasing its width to 10 meters.) At the corner of the block, steps create visual and access connections to the second floor level. The open corners of certain streets allow diverse activities like outdoor restaurants or vendors. At the center of this street edge is a covered courtyard which has stairs to the open courtyard at the second-story level. Both courtyards allow vending and restaurant activities.

On the other side of this courtyard is the entrance to the vertical core which services the center portion of the northern building. Hallways connect this lobby space with the other two lobbies at grade which can be entered from the west and east sides of the block. At the northeast and northwest corners of this floor are motorcycle and scooter parking. Closer to the center of the north edge of the block are ramps down to the parking level. And at the center of the block, the building is indented inwards to allow a covered zone for loading and short-term parking.

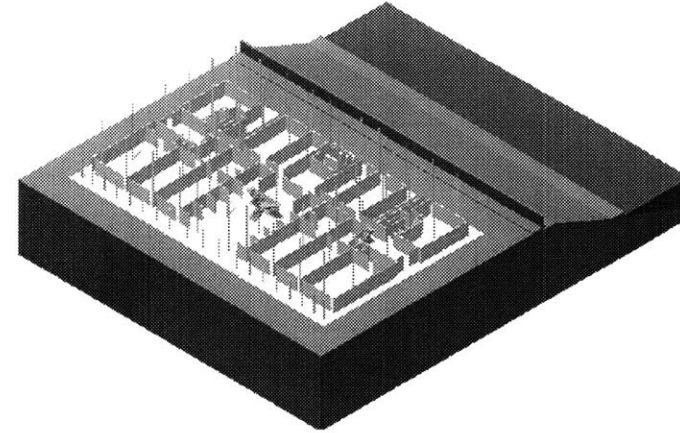
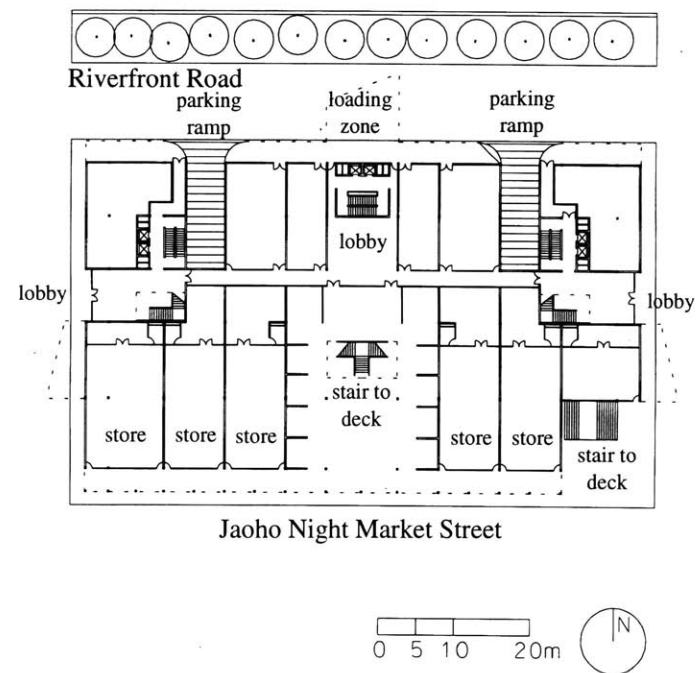


Fig. 4-29 Ground Floor Isometric

Fig. 4-30 Ground Floor Plan



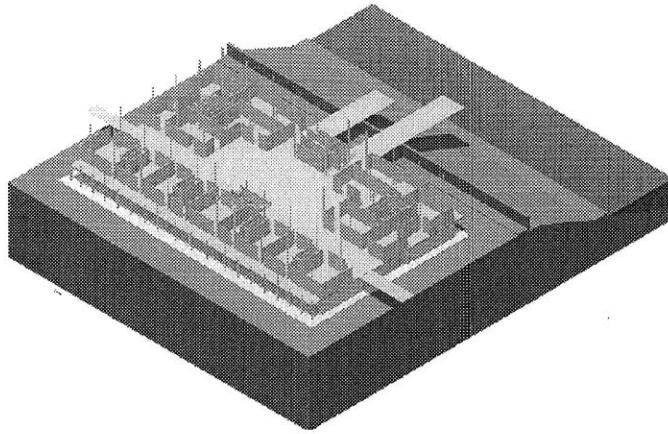
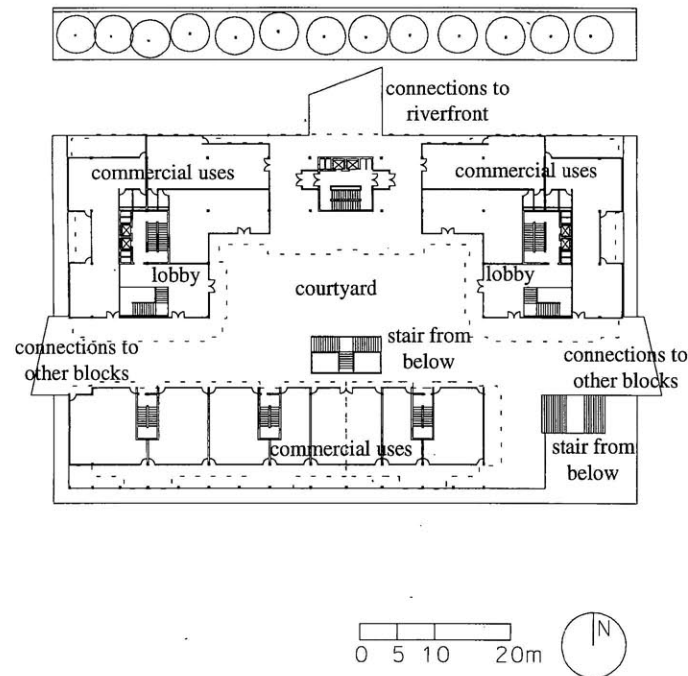


Fig. 4-31 Second Floor Isometric

Fig. 4-32 Second Floor Plan



The Second Story. This floor provides a new urban condition for the residents of this area of town and demonstrates the benefits of coordinated urban design and development. A raised courtyard that is accessible from the street level by stairs at the center and corners of the block rests between the southern and U-shaped northern unit. The second story creates a new street level that is not so dense as Jaoho Market Street and has an intense series of connections to the riverfront.

Commercial uses line both the south and north buildings along this second story platform. These shops target a smaller neighborhood market, and may include gyms, clinics, day care centers, and other services. Of course, the intensity of these uses depend upon their location within the Riverfront District. The floor plate at this level extends all the way to the northern edge of the block, providing a covered sidewalk underneath which doubles as a loading zone and short-term parking. Commercial spaces is recessed to provide a zone of shadow and rain cover.

The stair cores for the southern unit begin at this second-story level. There are lobbies for the cores in the northern unit as well. Bridges over the Riverfront Road in the middle of the block connect the level to the riverbank. Stairs makes it possible to descend to the riverbank.

Floors 3 to 6. These floors contain replacement housing. In the southern unit, each staircase serves two units. Each unit overlooks both Jaoho Street and the second-story courtyard, fronts both spaces and has very close relationships to the life on both. The units range from studios (40 square meters) to two-bedroom / two-bathroom units (75 to 90 square meters). Rooftop amenities include greenhouses, wading pools and gardens.

The U-shaped northern housing opens to the south to capture the sun in its courtyard. The public spaces for each housing unit face the courtyard or the riverfront. Bedrooms are usually given their own balconies, so that screens can be created to provide additional layers of privacy. Six of the fourteen housing units on these floors face the courtyard, and the remaining units either have a corner view or face the river. Each unit also has balconies adjacent to the public spaces. As a result, the facades of the buildings have many indentations which emphasize the verticality of the building. These floors also build out to the edge of the sidewalk and to the north edge of the block.

Table 3 Unit Sizes in Housing

Number of Units	Configuration	Size (square meters)	Size (ping)
4	2 bed / 2 bath	100	30
4	2 bed / 2 bath	80	24
4	1 bed / 1 bath	70	20
2	2 bed / 2 bath	110	34

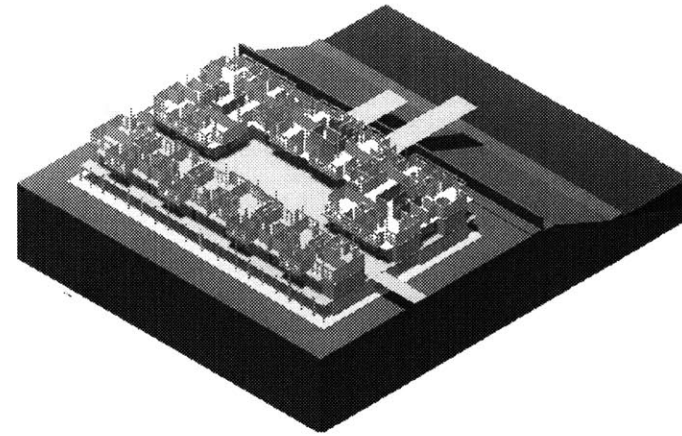
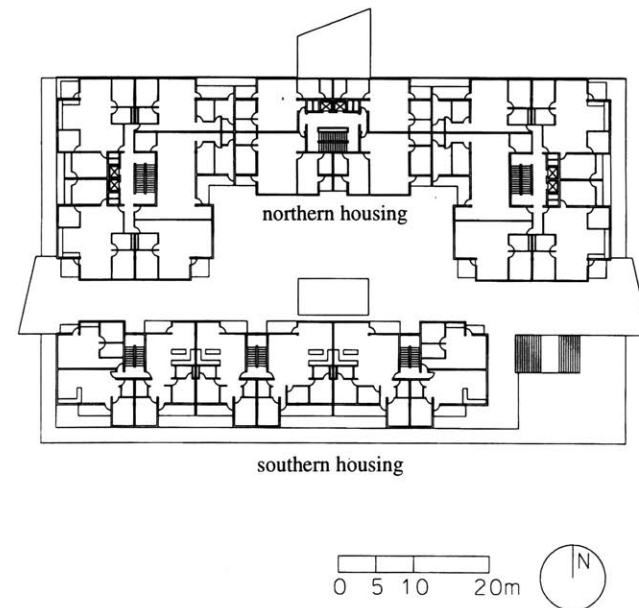


Fig. 4-33 Residential Floor Isometric

Fig. 4-34 Residential Floor Plan



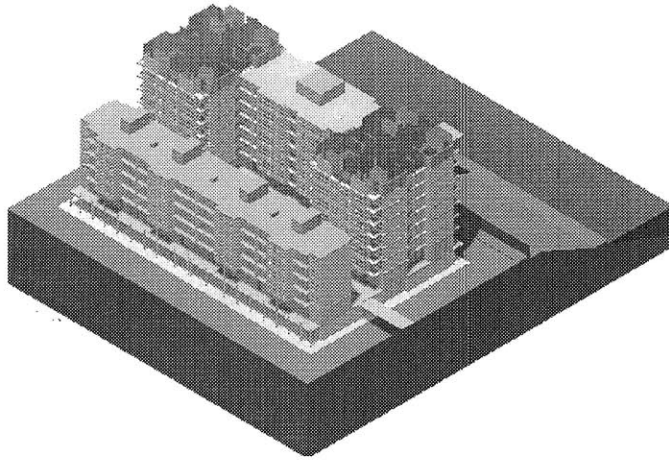
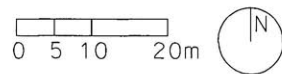
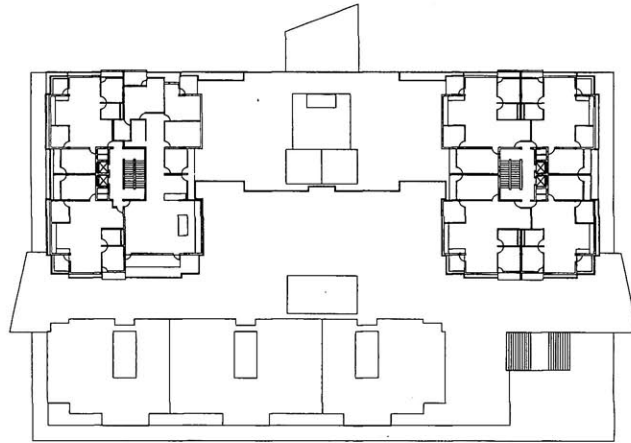


Fig. 4-35 Tower Floor Isometric

Fig. 4-36 Tower Floor Plan



Towers. The market-rate housing has better views and access to sunlight than the units on the podium below. These units also have access to rooftop amenities such as lounges and gardens and each unit faces at least two compass directions. Tower units are served by the same lobbies as the public-housing podium. One elevator in each core would stop in these tower floors. At certain levels, two-story duplexes create luxury units which have more dramatic interior spaces and enclosures.

The towers are set back one meter from the six-story podium. Each unit has at least two bedrooms and two bathrooms and a minimum of 110 square meters. (The average dwelling unit in Taipei is 107 square meters). The heights of these towers may be traded in order to emphasize certain site conditions. In the proposed vision for Sung Shan Riverfront District, 20-story elements emphasize the north-south streets which intersect Riverfront Road. These towers are also reduced nearer Sung Shan Temple to provide privacy and to respect the historic building.

Facade Design

The facade design reflects the use of the spaces beyond. The windows for the public spaces are larger than the private bedroom spaces. Bedrooms usually have access to an exterior balcony.

It is difficult to hide the bulk of large towers such as those proposed for Sung Shan Riverfront District. The bedroom balconies at the center of each tower are recessed to reduce the wall-like effect of the facade, and other strategies are suggested to break up the height of the building. One of these strategies is two-story units which create a horizontal pattern within the facade. Other strategies, are discussed in the next section, are smaller flexible elements.



Fig. 4-37 Proposed Building Facade

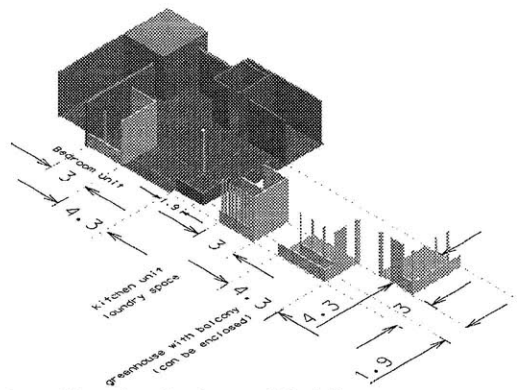
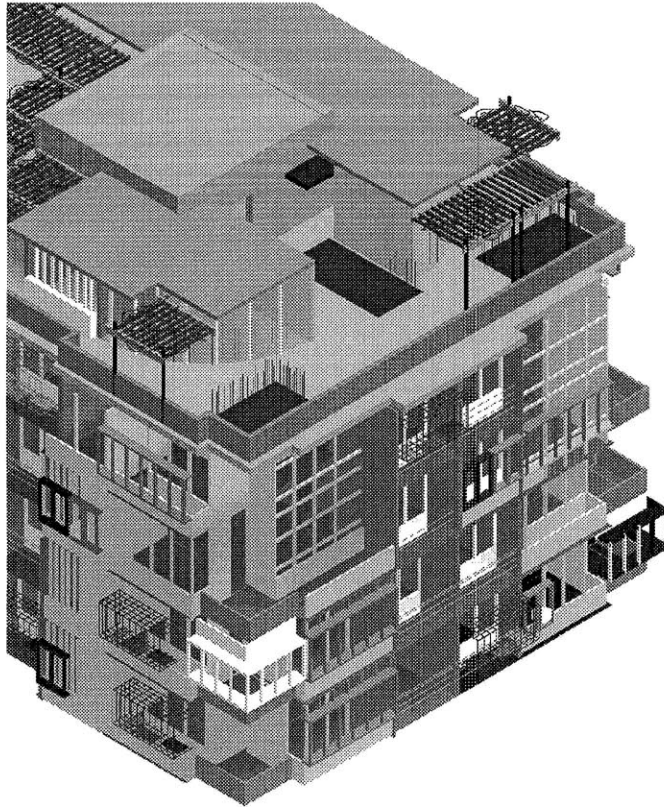


Fig. 4-38 Housing Enclosure Modules
 Fig. 4-39 Claiming of Facade by Residents



Unit Flexibility

The column schedule for the housing allows various corner unit enclosure. A three-meter cantilever at the corners allows modules to be installed. These modules may include kitchens with an attached exterior laundry balcony, small bedrooms, green houses and studies. These modules are roughly three meters by three meters or three meters by four meters, and can be mixed and matched by the owner of the unit depending on the space requirements. For example, traditional Chinese kitchens are usually enclosed rooms, and may be preferred over the open kitchen/living room.

Smaller enclosure units such as cages for plants, air conditioner mounts, and balcony enclosures comprises a secondary “kit of parts.” These would provide even more texture and liven up the facade of the building. These enclosure and module units can be designed by the architects of each site and would give them a sense of coherence across the development. The way that these units can be applied, however, would be determined by a set of predetermined rules. These rules and structures would be preapproved to insure safety. This process of organized chaos would allow the Chinese residents and designers to shape their own architectural form within a regularized architectural framework.

Phasing of Site

As with any redevelopment of a site, careful consideration must be given to traffic congestion, noise pollution and displacement of inhabitants. Certainly, construction must be planned in such a way as to minimize all three. A pilot project may target the “softest” or most decrepit portion of the site and eliminate the need for substantial off-site housing. A pilot project may also target willing owners. The phasing is also dictated by the development forces surrounding the site.

Phase I. The first large development near the Riverfront Site will be the new Sung Shan Train Station. Its adjacent areas will be the first to feel new development pressures. It makes sense, therefore, to redevelop the Temple Plaza area first. This first phase of development will require off-site housing for residents who may be displaced in subsequent phases, and will feature new commercial uses that may fuel growth in the area. The housing units may be converted to commercial uses in later phases.

The Temple Plaza is created by relocating the street in front of the temple. Infrastructure is imbedded for the new MRT station in the future. The western end of the Sung Shan Elementary School is redeveloped as a commercial building, with enough smaller, transitional housing units to house the displaced residents of the first and second phase. There may be more commercial uses in the first few blocks in order provide more income to redevelop the rest of the site.

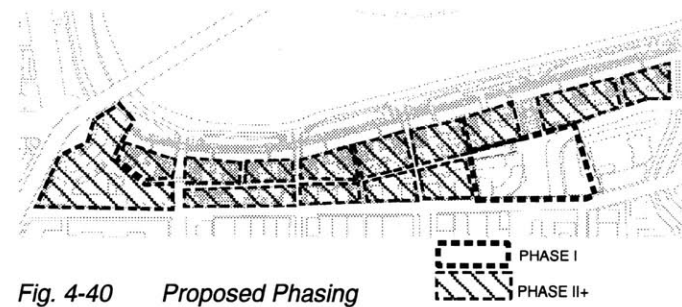


Fig. 4-40 Proposed Phasing

Table 5 Phasing Schedule

	Retail/ Comm. (sq. m)	Residential (sq. m)	(units)	Parking (spaces)	Open Space (sq. m)	FAR
Existing	56,000	130,000	1,300	475	0	3.5
Proposed Total	203,400	197,000	2,290	3,440	25,000	6.0
Phase I (Temple Plaza)	24,000	7,500	150	315	4,000	5.0
Phase II+ (Typical Block)	3,840	14,080	164	150	1,000	6.6
Keelung Plaza	105,000	0	0	1,050	4,000	6.0

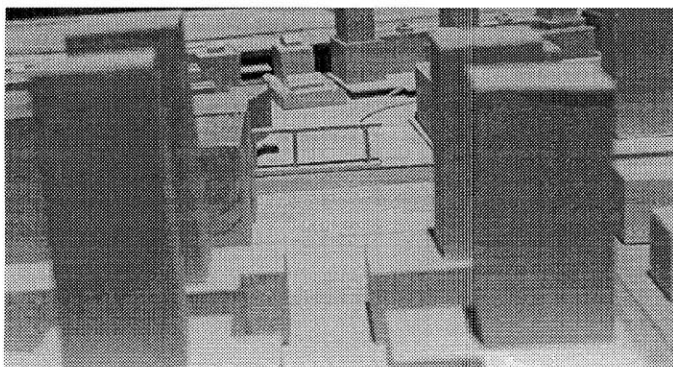


Fig. 4-41 First Phase is Sung Shan Temple Plaza

Phase II and beyond: Redevelopment of the site should be at the block scale. Keelung Plaza, an enormous development at 105,000 square meters, can be designed to be built in several stages. There should be coordination among sites in order to minimize the environmental and infrastructure impacts and realize the proposed urban design. One criteria is to disrupt the Market Street as little as possible and to relocate the street where it can be viable during construction. This may mean that sites along the riverfront are developed first, in order to preserve at least one side of the Night Market Street. The role of the City of Taipei is to manage the development of this part of the city. The city can design and phase the redevelopment so that all existing uses are replaced on site with minimal impact on current residents.

Impacts

A thousand new units of housing is added to the site, an increase of 50%. This seems a reasonable level for a city that adds roughly 20,000 units per year to its housing stock. The bulk of the impact on traffic and market conditions occurs during the development of the public spaces. Total commercial space increases by 400%. The relocation of the Temple Street and the building of the Temple Plaza will impact traffic on Nankang Street. Keelung Plaza will require a major street realignment. Careful planning will allow the commercial market to absorb the Keelung Plaza development. Block housing redevelopments, however, would be less disruptive. Construction within a block can be staged to lessen the impact on neighboring areas.

Reflections

The urban plans and visions for the Riverfront District are dramatic to show how different Taipei can be. The density of residential, commercial and recreational uses will increase. Inappropriate uses is relocated. The real impact of this design is in the differentiation among these uses. The new vision for the Riverfront District clearly articulates the differences among the uses and spaces. It concentrates retail and commercial uses along streets. It allows different levels of privacy and varies density.

Certainly with these building densities, the surroundings will be impacted. Riverfront Road, for example, will no longer be the two-lane green parking street it is now. Instead, it will connect Keelung and Minshuen Roads with the booming Nankang District to the east with four lanes of traffic. By creating these larger roads, however, it becomes possible to preserve and promote a pedestrian network. North of Jaoho Street, pedestrians and vehicles are separated vertically. In dense cities such as Hong Kong, this separation has proven to increase the efficiency of roads and improve the pedestrian environment.

The tallest buildings are located on the north edge of the site (the exception being the commercial buildings at Keelung Plaza). Cooling breezes may move through the site easier when the site is developed, since they usually flow from east to west from the coast of Taiwan. The microclimate within the housing, however, has to be studied in more detail.

The riverfront may be impacted positively as well. The increased use may

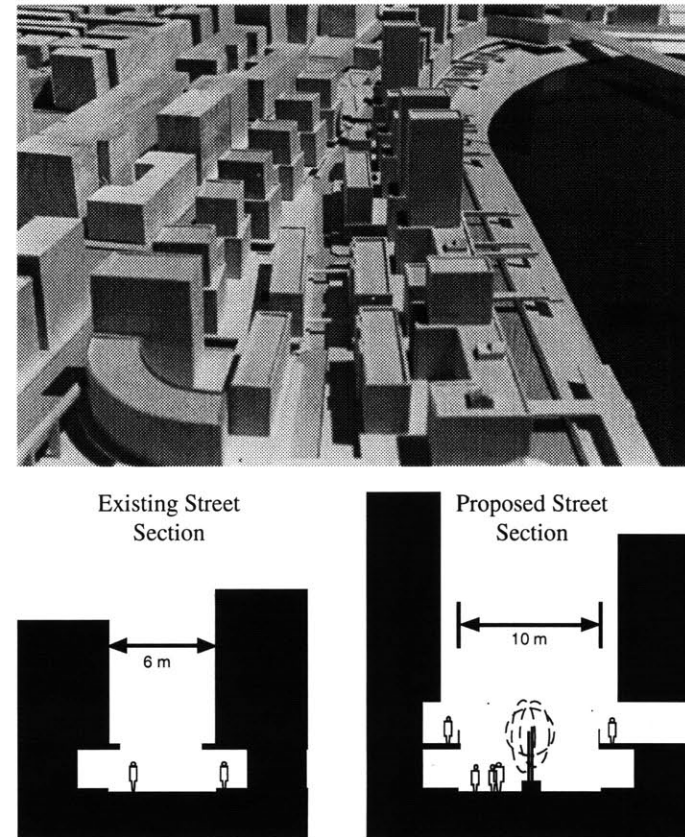


Fig. 4-42 Housing Form Attempts to Preserve Jaoho Street

create a new awareness of the river. Intense use zones, like the one proposed for the Riverfront District, may be offset by new preservation zones planned for other parts of the city. Having examples of good linkages to the riverfront may encourage other areas to rediscover the river.

Another caveat for an ambitious plan of urban redevelopment is the resistance that might occur to the development. These sentiments have to be balanced against the dangers of an unstructured redevelopment atmosphere. Developers are not always sensitive to the context around their developments, and the City of Taipei must establish the rules of the game by which to make decisions. One strategy would be to declare the Riverfront Site a Special Zoning District, in which new rules can be written. This foresight — and vision — is ultimately better than haphazard preservation of small portions of the site.

¹ Kevin Lynch, *The Image of the City*, (Cambridge, Massachusetts: MIT Press, 1960) 62.

V. IMPLEMENTATION STRATEGIES

GENERAL IMPLEMENTATION METHODS

Implementation of urban design schemes can be problematic where there is not a long history of government involvement in regulatory and design processes. In Taipei, these tools and lessons are beginning to emerge from a relatively short history of formalized urban design. A set of master and detailed plans for the East-West Railroad Submersion have emerged to address the impacted areas of the city. The scope of the work, however, is intended to “build up land development control and urban design guidelines in new districts and special redevelopment districts in urban areas.”¹ These control and urban design guidelines do not, however, take an active role in generating redevelopment in these districts.

It is imperative to declare the district to be a Special Development Zone. Innovative regulations and incentives for this visionary urban design scheme would encourage the development of this district. This special status would allow the site to be exempt from established requirements and be more flexible, allowing both the government and developers more leeway in promoting growth. In order to encourage development, the government can:

- Regulate the design guidelines and create a legal framework within which development must take place
- Create incentives to use the design guidelines, such as FAR bonuses for public spaces and connections

Fig. 5-1 View of Jaoho Street from the East

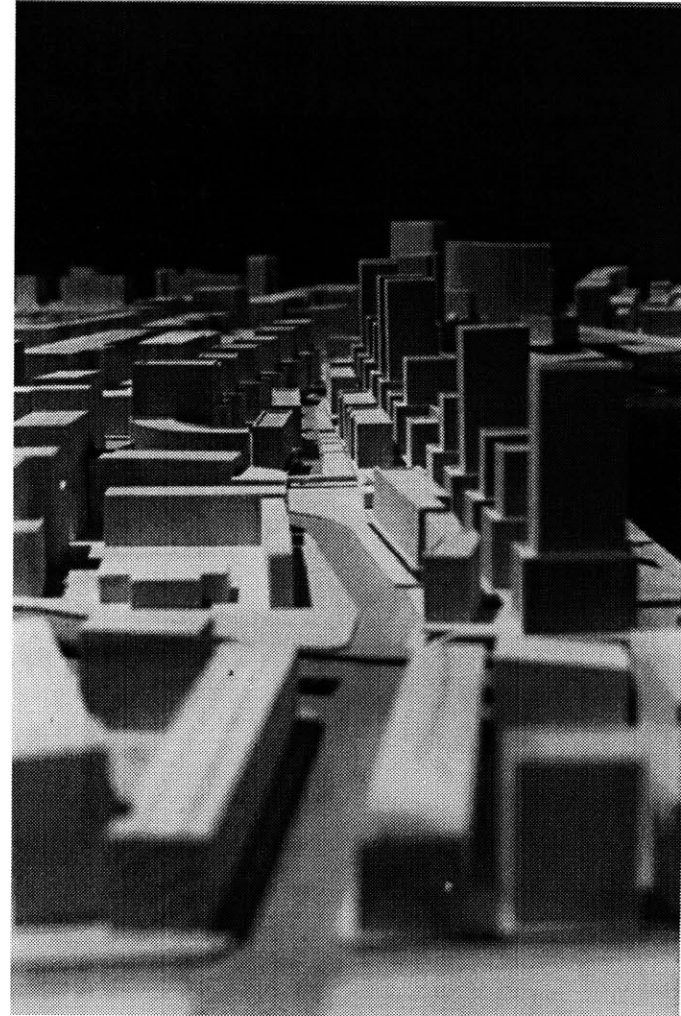


Table 5 Techniques and Issues in the Implementation of Urban Design

Technique	Scales		
	Site	Block	Subblock
Regulation	block configuration urban design zoning financing	land assembly reparcelling river connections	2nd story deck public spaces open spaces
Incentives	block configuration FAR bonus zoning financing	land assembly reparcelling river connections	2nd story deck public spaces open spaces
Legal Rights	block configuration redevelopment rights zoning financing	land assembly reparcelling river connections	2nd story deck open spaces public spaces
Information	Urban Design riverfront uses	river connections	amenities
Government as Developer	parks public plazas realign streets riverfront amenities		

- Provide legal rights to trade property such as development rights. The government provides ways to settle disputes through courts.
- Use information to guide development in the name of “good practice,” without the power to force compliance.
- Develop the project unilaterally

There are three basic questions that need to be answered in order to successfully implement an urban design scheme: 1) Who will develop a project? 2) What will make them do it? and 3) How will it work? A project of the scale in this proposal requires a combination of all five techniques. The involvement of different players change at different points in the process. The government is interested in the district or city-wide level and is concerned with infrastructure and the public realm. Developers tend to look at the block level and individual plot level, since the block is a basic unit of redevelopment and has to be assembled from the individual owners.

Three of the most important obstacles to redevelopment of the Sung Shan Riverfront Site are land assembly, block configuration and rezoning. A simplified matrix shows implementation issues and techniques for addressing these issues.

At the site level, the government will take on the daunting task of land assembly, reconfiguring the street, and making major infrastructure changes, such as the creation of the Temple and Keelung Plazas and the public park on Nankang Road. The government will also create riverfront connections at the public streets. The most likely agency within the city government to oversee this

effort in Taipei is the Department of Urban Development. This body will also develop regulations for reconfiguring the blocks, as well as establish legal rights for the land-owners, both before and after the fact. New horizontal and vertical zoning systems, coupled with a higher FAR, will create a favorable redevelopment scenario.

Another appropriate strategy would be to view the site as a land resubdivision project. The government, with a vision of the district in mind, assigns new rights to each property. Zoning guidelines for new uses and infrastructure at the second story level will add complexity to these property rights. At the block level, the government will provide regulations, incentives and legal rights for the building form.

Developers and land owners building on the Sung Shan Riverfront District would be required to construct their section of the second-story deck. The connections at this level to the riverfront and other blocks will make these redevelopments more economically feasible. One possible development incentive is to allow small-scale development by these blocks on the riverfront. The government can also suggest the form and frequency of the connections to create the best pedestrian atmosphere and increase the value of the land and development.

The government regulates the building mass and form within the block to produce the desired urban form. These building envelopes fit with the overall urban design guidelines to create public amenities which, in turn, increase the value of the development itself. Incentives, like FAR bonuses, can help pro-

duce these urban amenities. Ultimately, the private developers are the beneficiaries of high quality urban design with public amenities and a good pedestrian environment.

Implementation of the Riverfront District design requires the formation of a new authority to oversee the new, unique second-story structure. This authority would be responsible for issues of design safety, ownership and maintenance of pedestrian bridges and walkways, and upkeep of privatized riverfront grounds. This authority could also collect fees for the maintenance of the publicly-built infrastructure within the site.

Table 6 Costing Summary

FAR	Revenue/Cost
3.5 (High Rent)	145%
3.5 (Adjusted Rent)	103%
5.1	108%
6.6	114%
6.6 (Banking Model)	135%
7.6	123%

Costing Model

The costing model tests the redevelopment scenario at different Floor Area Ratios (FAR) using the current housing type in the Sung Shan Riverfront District. The current housing, with an FAR of roughly 3.5, has about half or more of its ground floor dedicated to retail uses. Using the commercial rental rate from the City Hall Joint Development Analysis, it gives a return on investment of 145% for a redevelopment at FAR 3.5. Using a much more realistic figure for retail rent in this district, however, shows that the return on investment is extremely sensitive to the retail rental rate. Halving the rental rate from \$13.50 per square foot to \$6.25 per square foot gives a return of only 102.6% for the same space configuration. Both government agencies and private developers require a return of at least 10% in order to justify redevelopment.

In the City Hall area, a second-floor retail space can command about \$5.00 per

square foot (compared to \$13.50 on the ground floor). Since the estimate for rental prices are halved for the Riverfront Study Site, this number could be about \$2.50 per square foot. The new second-level infrastructure in the design proposal would give the public much better access to these retail spaces, and thus it may be safe to double this rental rate to \$5.00. At an FAR of 5.1 (1 FAR is used for open space/infrastructure development), the new commercial spaces at the second story level boost the return up to 108%. The infrastructure at the second floor level would connect each block with other blocks and the waterfront. This 5.4% increase in return would justify the cost of building the network of second-story courtyards and connections.

The housing with towers (FAR of 6.6) adds an additional 1.5 FAR of market-rate units to the previous model. The return for this housing combination is 114%, if all of the units are rented. Selling the towers reduces the maintenance and tax burdens on the developer, but also decreases the long-term revenues, and the return hovers around 114%. Selling both public and private units does not change this percentage dramatically. These tower units are part of the key to making the redevelopment of these blocks appealing and profitable to both government and private developers. Each increase in FAR for these market units creates an increase in the return of about 8.5%. For a building of FAR 7.6, the return rate is 122.6%

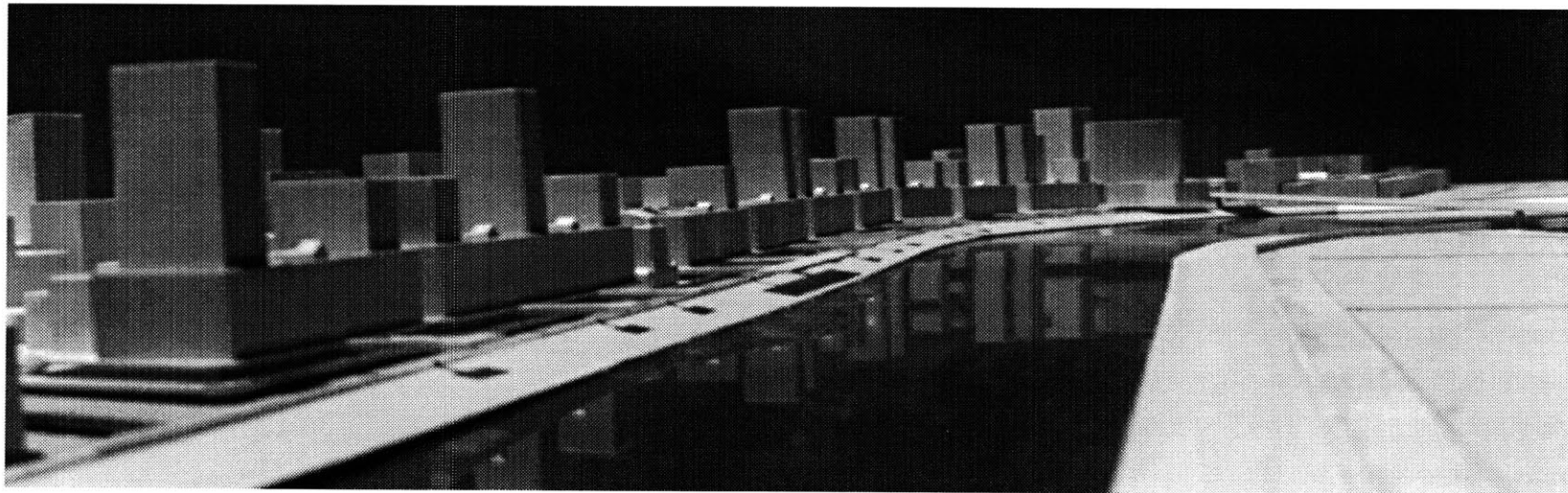
A better costing model for the housing block takes into account the cash flow over the building's life time reflects the unique pre-sale system in Taipei. This banking model considers the ability of developers to secure lower-interest loans (sometimes by as much as two percentage points) in both the public and the

private sectors than individuals. The analysis for a building of FAR 6.6 gives a return of 135% compared to 114% for the simple present-value model. This model assumes that the developer secures a private-sector loan for the non-housing portion of the building and the new infrastructure at the second story level. If this portion were jointly developed through public and private funds, the return may be more favorable for the developer.

The Taipei City government will need to study this range of FAR from 6.5 to 8 in order to weigh the return on investment against the effects of high-density development. The government needs to provide a package of regulations, incentives, rights and information to developers in order to achieve the best possible urban conditions.

¹ Department of Urban Design, Taipei Municipal Government, *The General Scope of Urban Design in City of Taipei*, 1993, p 5.

Fig. 5-2 The New Riverfront for Sung Shan District



VI. EVALUATION

A development at the size and scope of this vision for Sung Shan Riverfront District is unlikely to be built under the present conditions in Taipei. The status of Special Development District is needed to an environment where new sets of regulations and incentives must be written to achieve specific design goals.

Several criteria can be used to judge the success of the urban design. 1) Can the Night Market Street survive competition with the second-story deck? 2) Are the public spaces indeed better? 3) Is the system rigorous enough to survive a “holdout” block? 4) Can it be implemented? and 5) Will the benefits, real and perceived, outweigh the costs?

The preservation of the Night Market is dependent several aspects of redevelopment, such as urban design, cost control, and phasing. Urban design of the Night Market Street must create an attractive and pleasant shopping atmosphere. Landscaping, signage, and shop facades should be controlled, but still allowed to express individuality and richness of the old Night Market. (The City of Taipei has demonstrated ability to do this in the Street Beautification Project.) Rent must be held at a level which would allow Night Market uses to remain, but developers may ultimately price the ground level much higher than the second story level. This is likely, since second-story public spaces have much more usable outdoor space than ground level shops. Night Market Street may become a linear shopping street for which the second level provides food and local services. This differentiation of public spaces would form a richer urban scene.



Fig. 6-1 *Can Jaoho Street Survive Redevelopment?*

Good architecture should provide the setting for these public spaces and allow a variety of uses. Careful programming and new vertical zoning laws would prevent conflict between residential and commercial uses. Housing design guidelines proposed in this thesis are in a difficult position of having to be descriptive enough to provide general guidelines, yet vague enough to encourage variety.

The question remains whether this second story level could be a success if some blocks did not follow development guidelines. The government has to encourage the development of the entire network, but should have contingency plans in place. It can, for example, zone easements along Riverfront Road so that at least one edge of a “holdout” block can be connected to the network. There is no general rule whether one undeveloped block can cause the failure of the entire site, because the program of the spaces have much to do with its importance within the network. The agency in charge of writing urban design regulations must be prescriptive in allowing a minimum of connections within any block.

Benefits of this design scheme include an increase in residential and commercial spaces, more public spaces, and connections to the riverfront. Costs include traffic congestion, replacement of a historical street and neighborhood, and environmental impacts from high density. Political figures, planners, developers, and owners must weigh the impacts of redevelopment against its benefits, and propose strategies to mitigate some of the costs through careful design and planning. A New Vision for Sung Shan District provides a framework for this discussion.

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Fig. 1-2

Fig. 1-3

Fig. 1-6

Fig. 2-2

Fig. 2-7

Fig. 2-8

Fig. 2-9

Fig. 2-14

Fig. 2-15

Fig. 2-16

Fig. 2-18

Fig. 3-1

Fig. 3-3

Fig. 3-5

Fig. 3-6

Fig. 3-7

Fig. 3-11

Chu-tzu Hsu in **Urban Dwelling Environments: Taipei, Taiwan**

Fig. 2-1

Fig. 2-25

Taipei Municipal Government

Department of Transportation

Fig. 2-3

Fig. 2-4

Fig. 2-5

Fig. 2-6

Department of Housing

Fig. 2-19

Fig. 2-20

Department of Urban Design

Fig. 2-21

Fig. 2-22

Fig. 2-23

Fig. 2-24

Fig. 3-2

Fig. 3-8

Fig. 3-9

Fig. 3-10

Reed Dillingham in **A Survey of Traditional Architecture of Taiwan**

Fig. 2-12

Fig. 2-13

Free China Review Vol.45 No.4, April 1995

Fig. 2-10

Fig. 2-11

Fig. 2-17

Fig. 2-26

Fig. 4-4

Yoshinobu Ashihara in **The Aesthetic Townscape**

Fig. 4-5

Kevin Lynch in **The Image of the City**

APPENDIX A: ENCLAVE CITY

Enclave City is based on the recognition of a modular and self-supporting unit of residential fabric which makes up most of the city of Taipei. This unit, called the **enclave**, has an inner core of residential uses, supported on the ground floor by neighborhood retail and services such as grocery stores, laundries, and food stalls and a periphery of intense commercial uses, fronting the larger arterial roads. This grain is recognized as having a logic that should be intensified in order to offset the effects of increased density while also providing opportunities for more livable urban spaces for Taipei.

Description of Special Areas

Three new activity nodes lie between enclaves: the Sung Shan Train Station, the Cultural District across from Sun Yat Sen and City Hall, each linked together in the *Enclave City* scheme by the character of their “public” nature. Defined by a larger form and street grid — quite distinct from the smaller-grained enclaves — these nodes are the centerpieces of major redevelopment, expected in the area. The redesign of these activity nodes introduces expanded opportunities for joint-transit development, office, commercial, business and personal services, residential development, and an improved pedestrian environment.

Approach to Design

Enclave City takes a closer look at the meaning of city fabric. Instead of seeing

patterns that emerge at the city-wide scale, Enclave City argues that the city is a replication of a modular cell that repeats itself, over and over again. This cell has boundary and interior conditions as well as a critical interior dimension that is needed for its survival. By manipulating the characteristics and relationships among and within enclaves, strategies emerged for addressing the opportunities in the study area.

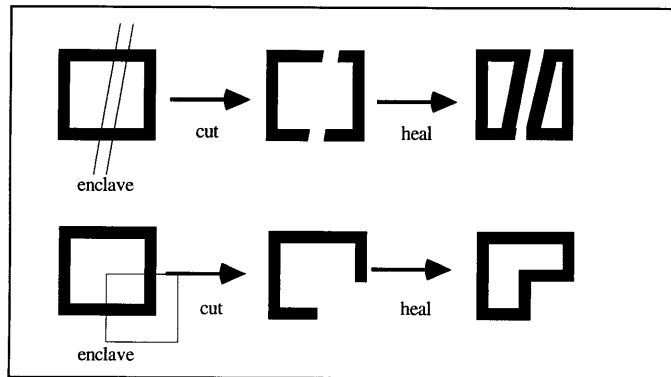
Approach to Analysis

The range of uses within each enclave typically includes city-wide and local commercial activity, residential activity, schools and open space. To develop recommendations for the intensities of activities as well as the mix of uses within the enclaves, an analysis was undertaken to determine size, density and mix of uses that currently exist within these units.

Behavior of Enclaves

Two operations occur frequently to single cells: the linear cut and an area cut. The linear cut may be as succinct as the planting of trees along an interior street, or as readable as cutting a new expressway through it. Either way, the cell undergoes a healing process that may or may not be readable at the district scale.

These relationships were examined in the areas where minimal dimensions for an enclave are critical — best exemplified in the study area between the depressed railway and the river.

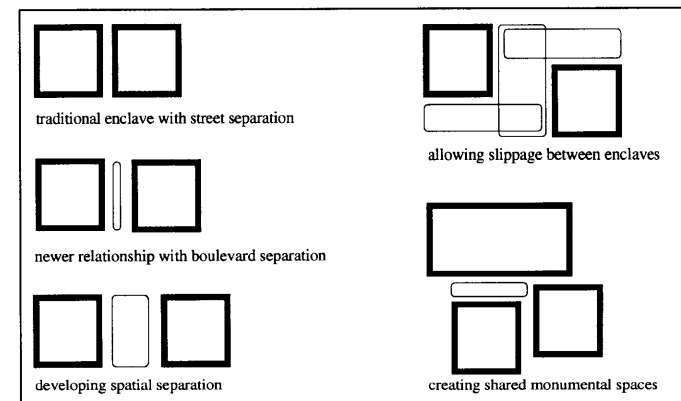


Behavior of Cells

Relationship Among Enclaves

Good urban spaces have been created by building upon the relationships among Enclaves. One criticism of Taipei is that the enclaves are too closely knit, and that the only relationship among them are the linear — not spatial — road conditions. Manipulating the edges of enclaves and allowing them to slip and pull away from each other, creates conditions for more interesting spaces while still allowing the enclave to work. The exterior of the enclaves creates monumental space, which may be claimed by many groups, while the interior serves to create connections to these spaces.

For this strategy to work, however, there must be some regular pattern to work against or deviate from. The grid pattern of Taipei gives very strong clues to how to contain the edges of enclaves. Enclave City embodies this logic and extends it throughout the Sung Shan Redevelopment District.



Opportunities Among Enclaves

OPPORTUNITIES OF SUNG SHAN DISTRICT

Under this logic, the cultural area has the potential of becoming a public enclave, with large, effective urban spaces. It would not, however, have the shared monumental spaces, characterized by the residential enclaves. The opportunity for recreating the enclave occurs on the west end of the rail yards where new residential development is designed to meet the northern edge of the cultural zone at a new space, also marking a new North-South corridor for Taipei.

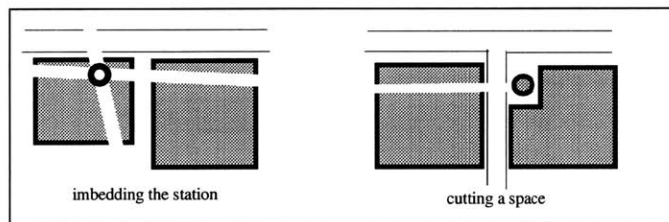
New Monumental Space at Cultural Center

The current Sung Shan Train Station area presented another challenge. Diagrammatically, the space lies between four other enclaves, giving it a flexible and interesting character but also creating a difficult role as a monumental space. To address this parts of this “space-between” have been developed into a high-density public enclave of its own, leaving a smaller piece as a separate arrival space for users of the transit station.

Train Station Area

Subway Linkages

There are several strategies for the recognition of transportation points within Enclave City. The stations have either been embedded within an enclave and linked to the streets that border and penetrate them or they have become “spaces-between” so that the stations are shared among the enclaves that they serve.



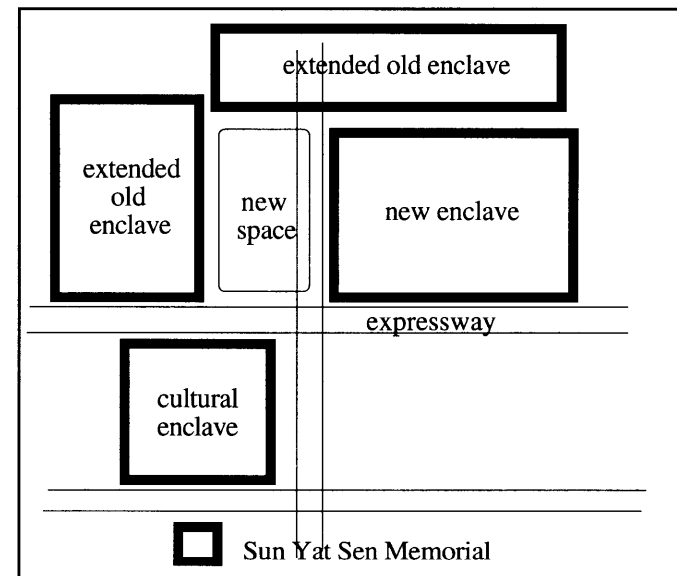
Stations and enclaves

MAJOR CONCEPTS

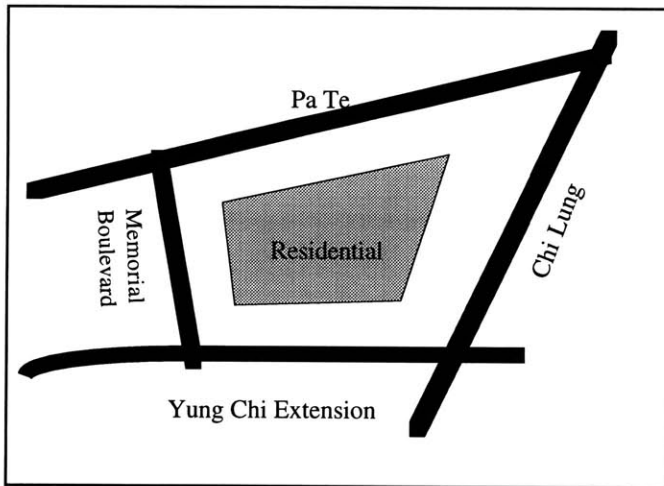
Cultural District

Like residential enclaves, the new Cultural District is ringed by taller buildings on its edges which step down in height to create a pedestrian environment activated by commercial and institutional uses within the center. The vision for this District is an institutional edge protecting a smaller-scale commercial core defined by atria that are more recollective of the small-scale markets of Taipei. This scheme reinforces the axuality of the Sun Yat-Sen Memorial, without re-creating the monumentality. Features of the District include an underground level which connects to the MRT station, a semicircular space on Chung Hsiao which connects the street level pedestrian activities with underground parking, and a large “green street” that connects the District to the northside enclave.

The cut imposed by the new elevated highway on the north edge of the Cultural site has been dealt with by creating a new zone of large commercial buildings between the expressway and a new road to the north. A new city plaza with large commercial buildings ring the edges. The plaza is the largest of a series of open spaces along a new North-South corridor that links both the Cultural District to the newly-planned city plaza by a pedestrian street. The area directly underneath the expressway is activated with parking structures and small markets.



New Monumental Space at Cultural Center



Railyard Development

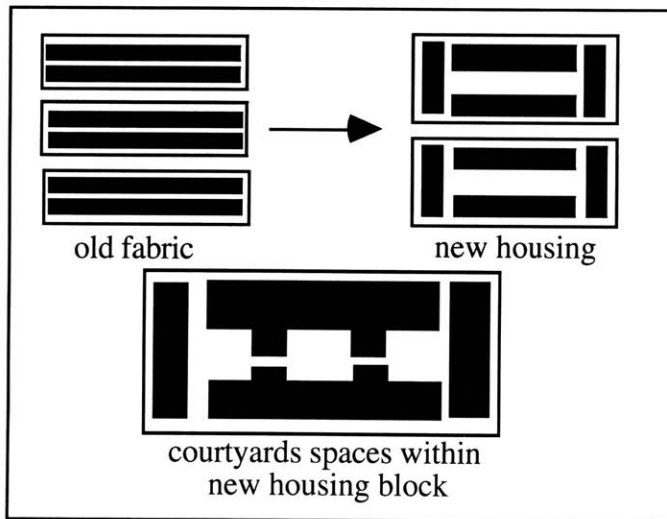
Railyard District Development

The Rail Yard area is seen as an opportunity to develop a new residential enclave. The East-West streets to the north and south have intensified edges of dense commercial uses. Pa Te Road has become the north edge of the district and the new larger-blocked residential fabric stretches across the depressed railroad to continue the logic of the road system.

Residential Fabric in the Railyards

This area is a proving ground to test new housing types derived from analysis of the existing residential fabric. The block dimensions were determined by taking three existing 40-meter residential blocks and creating two blocks from the same area using a 55-meter depth. This creates opportunities for usable courtyards within the block. Enclave City demonstrates that it is possible to increase the FAR and create better living environments at the same time.

Residential Fabric in the Railyards



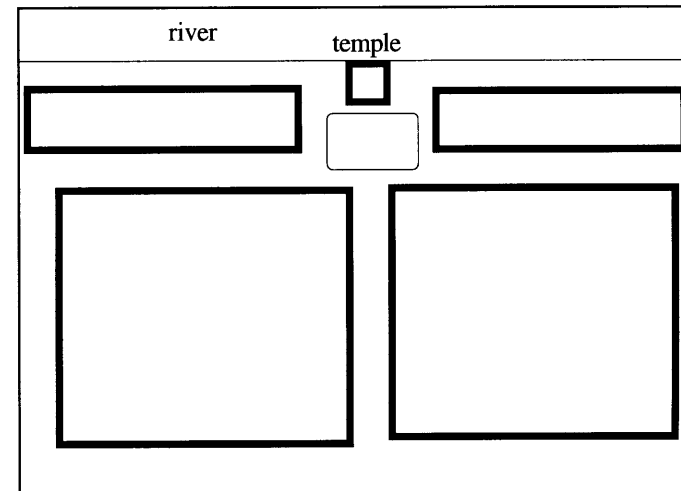
New PaTeh Boulevard

Pa Teh Road is now upgraded to a Boulevard, carrying more east-west traffic than before. New PaTeh Boulevard is built over the depressed railroad and merges into Sung Lung Road as it nears the railway. Sung Lung Road has been downgraded to a local road, allowing the enclave to heal from the cut. A new park marks the entrance of the Sung Shan Development District at the juncture of PaTeh and Sung Lung Roads.

Sung Shan Station Development

The Sung Shan Development District has at its core the Sung Shan Station, a high density area planned to absorb a large percent of the growth pressures expected in the area. Large-scale development is planned for intense shopping and retail activities at ground level and large corporate offices above. The Sung Shan Area link transportation networks with the surrounding commercial areas and provide a variety of active and passive public spaces. Running north-south under the station plaza is a level of underground connections and commuter rail platforms. These underground passages allow a pedestrian at the southern crossing of Pa Teh Boulevard and Sung Shan Road to reach the MRT station at the Sung Shan Temple, an underground world popular during the hot summer months. The plaza at grade is activated with commuters, workers, and tourists frequenting the many retail and department stores in the area. A tree-lined pedestrian path links the corporate office development to the west, and parks at Pa Teh and Sung Lung to the Station Plaza.

Both the MRT and railway stations occupy a prominent place in a view corridor from Sung Shan Road to the Sung Shan Temple. Beyond the Sung Shan Temple, recreational and entertainment spaces are planned along the riverfront linked to the transit station by pedestrian platform bridges which continue across the Kee Lung River. Retail and commercial spaces span the bridge network, creating a series of inhabitable spaces such as the teahouse at the end of the river inlet.



Sung Shan Station Development

City Hall East

The development of a commercial district to the east of City Hall is seen as a north to south rather than west to east oriented district defined by a new residential enclave bordered by Sung Yung Road on the west and Sung Te Road on the east. These residential blocks use the housing prototype from the rail yard development. An express shuttle bus makes a loop with connections to a smaller scale commercial development, Sung Shan Station, the Cultural District, City Hall, and the World Trade Center.

Stories About Paths

As recent as 1970, local maps indicate that the Sung Shan area has a remarkable number of waterways, most of which have been covered by development. Enclave City aims to reclaim some of these channels, and though redeveloping them as a continuous waterway is not feasible, redeveloping them as a series of green spaces is feasible and would reference the historical past. In many cases, such as Chung Po North Road, downgrading the road system would reinforce the logic of mending the cuts that Enclave City promotes while improving the accessibility of green spaces.

Enclave City also extends this green system south as a way to protect encroachment of commercial development on residential areas. An application of this occurs in the area to the east of City Hall where Sung Yung Road becomes an edge to the residential enclave to the south of Chung Hsiao Road. The first block to the east of Sung Yung Road is zoned as commercial, and the

adjoining edge of the second block has a buffer zone of green space, connecting the north-south green corridor.

IMPLEMENTATION

Special Assessment District. Within the Sung Shan Redevelopment site special redevelopment districts are established and a “Development Impact Fund” (DIF), created from a portion of the incremental land value that would result if a higher FAR is allowed. This fund enables a district to fund all or part of the expense for specific improvements that are needed as a result of increased density. These include infrastructure, public amenities, and subsidies for uses and activities such as the City Hall/World Trade Center Express Shuttle.

Use Regulations. To promote a sustainable enclave, city-side or high intensity commercial uses are zoned to occur along major arterials, while residential and local commercial uses are zoned to occur in the interior.

FAR Limits. FARs are set at a level to seek a balance between increased density and quality of life. Profitable development is promoted through an FAR bonus which generates funds for the DIF.

Joint-Transit Development Agreements. Joint development agreements occur at and around transit facilities to promote densification and creation of public amenities. Agreement types include (1) station interface such as pedestrian and other system linkages-skywalks, tunnels, bus stops and shelters. (2) Air

rights and land lease with station interface and (3) incentive agreements where a developer builds a plaza and subway entrance for a FAR bonus.

Land Readjustment Strategies. FAR bonuses are granted in order to encourage development of larger parcels. The acquisition of smaller parcels will be achieved through an agreement which guarantees a comparable unit to existing property owners of desirable sites. The allowable FAR bonus will be high enough to ensure the project is profitable.

Phasing. In the first phase of redevelopment, planning and initial stages of development will occur around MRT station areas, the train station, the cultural center, the rail yard, the area east of City Hall and edges of the enclaves with some interior development replacing older one- to three-story buildings. The majority of development will be commercial and institutional.

Phase II. In the second phase, development will continue around MRT stations areas; along the arterial edges; below City Hall; area north of Cultural district; Sung Shan and Chung Hsiao; more interior residential develops to meet growing housing needs and; Riverfront develops spurred by 2021 Green line extension and river engineering project. Arterials have built up at greater heights and densities to protect the enclaves and cuts have begun to heal. Development is a mix of high density commercial and residential.

Phase III. By 2050 Taipei redevelopment district reaches full buildout. Riverfront residential and commercial area reaches maximum buildout after major engineering project; Sung Shan Train Station area reaches maximum buildout and

continues west; majority of older interior one- to eight-story buildings have been replaced with new higher density housing; MRT Station areas have built out at higher densities and cuts have healed.

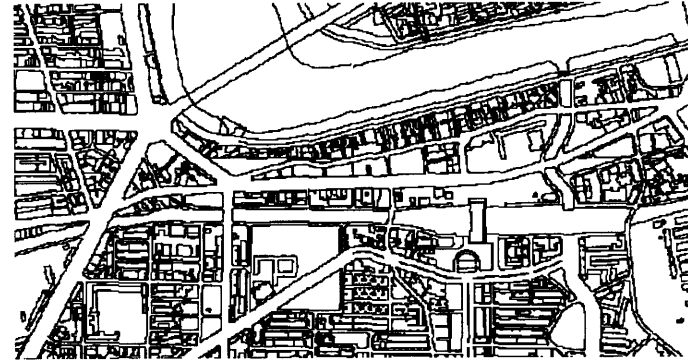
BENEFITS OF ENCLAVE CITY

- Preserves the quality of activity and intensity that defines Tapei while providing a more pragmatic approach to future development patterns.
- Increased FARs are achieved with respect for the spatial relationships that currently exist.
- Provides a system of public and private spaces connected by special cultural and commercial areas, pedestrian walkways, below grade concourses that offer a relief from the heat and above grade skywalks that allow people to circulate at an elevated height that features river and mountain views.
- Locates concentrated development in major activity nodes, preserving interior residential spaces and special areas such as the Garment District off of Sung Shan Road.
- Maintains much of the existing block patterns, extending it into the Rail Yard and Cultural District and strives to mend the cuts that threaten the life of existing enclaves.

APPENDIX B: PATTERNS

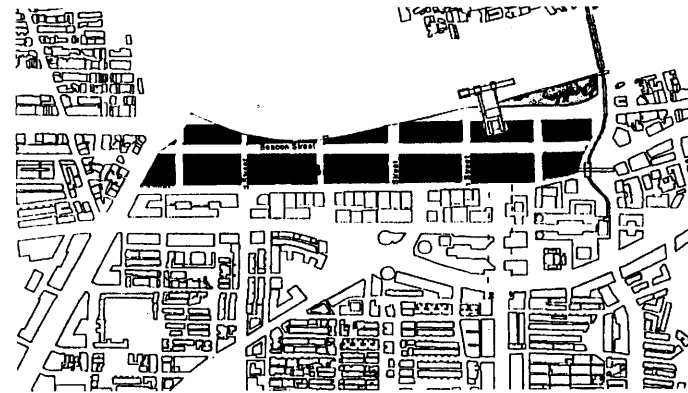
The Sung Shan Riverfront Site

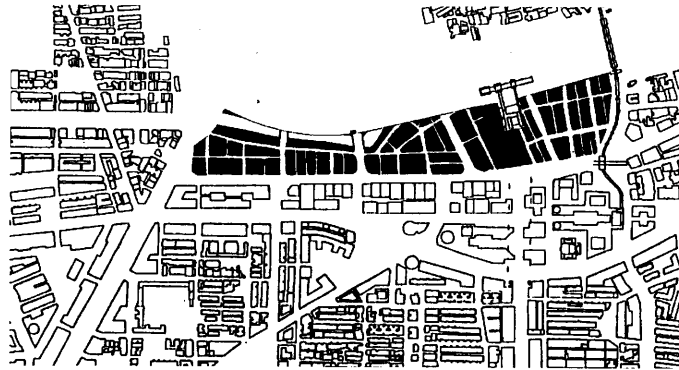
The macro issues are whether the block patterns fit into the existing grain and pattern of Taipei's urban fabric and whether the street hierarchy makes sense. Does the density of the sampled city fabric "work" within the context of the site? Does the structure of the street system help preserve and enhance some of the activities already on the site? Specifically, could Jaoho Night Market be preserved by the block patterns?



Back Bay, Boston, Massachusetts, USA

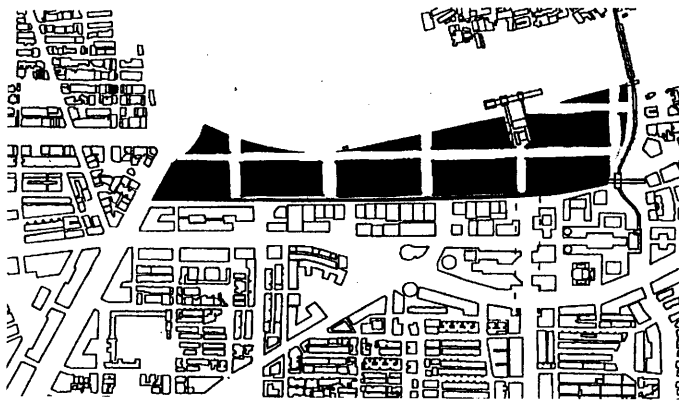
The 200- by 500-foot block size in Boston, Massachusetts is primarily for low-density residential uses. The block pattern is generally too large for Taipei, whose high-density residential housing types are walk-up slab buildings, which line both sides of the block, and have a minimal service alley in the midblock. The Back Bay housing has a generous setback from the sidewalk for a small greenspace and room for parking and a service alley in back. The imageability of the Back Bay, however, is a welcome sight in contrast the density of Taipei. The tree-shaded, human-scaled streets could be a new urban condition on the site.





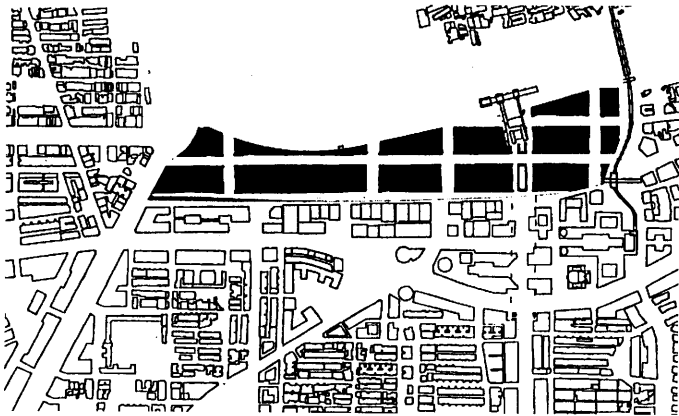
Nihombashi, Tokyo, Japan

Nihombashi, out of all of the grafts from other cities, most closely resembles the character of existing Taipei. East of the Ginza District and south of Marounouchi, Nihombashi was once on Tokyo Bay until generations of reclamation has isolated it from the water. The scale of four- to six-story buildings with narrow alleys is recollective of older sections of Taipei, and indeed some of the areas surrounding the Sung Shan Riverfront Site as well. There are no internal service alleys or streets, creating congestion problems that need to be addressed in any proposal.



San Francisco, California, USA

San Francisco's massive block size is less obvious in the context of hills and valleys. This 250- by 600-foot rhythm allows for intrablock circulation systems. It would be difficult, however, to create enough consensus among the owners of the Sung Shan site for a restructuring so massive.



Manhattan, New York City, New York, USA

The fabric of Manhattan with its 100-foot wide streets and avenues and 200- by 400-foot blocks creates some of the most imageable places in the world. The intense block edges create street conditions which can sometimes be harsh and unfriendly.

Madrid, Spain

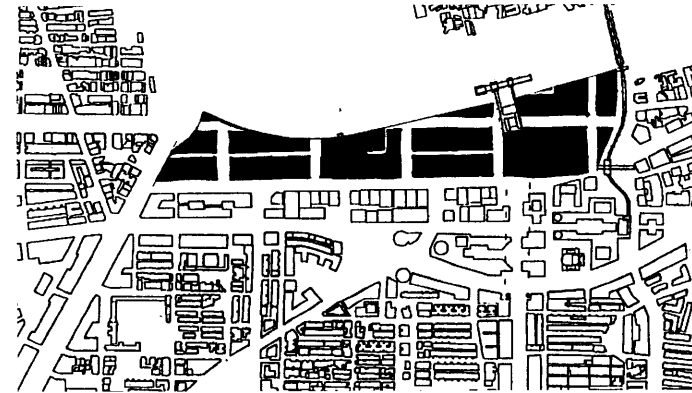
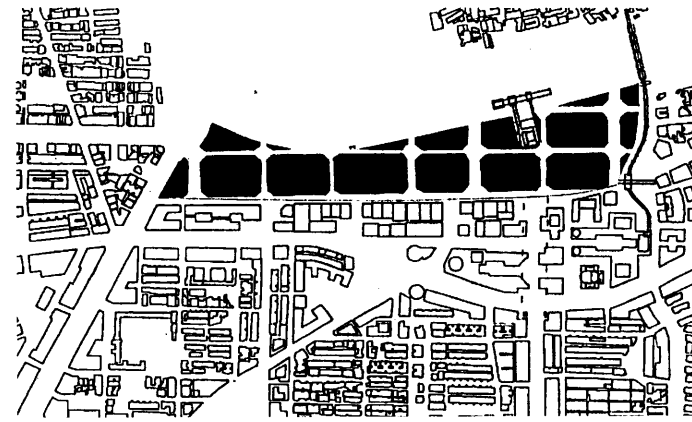
The 300-foot north-south dimension of the block pattern in Madrid is clearly aggregated into large systems whereby 6 to 12 blocks, grouped in rectangles, are bounded by much larger arterial roads which serve to form a strong pattern in the planned part of the city. From the sizes of the buildings in Taipei, however, it is clear that the depth of the block creates a need for an intrablock access system, which is not found in Taipei.

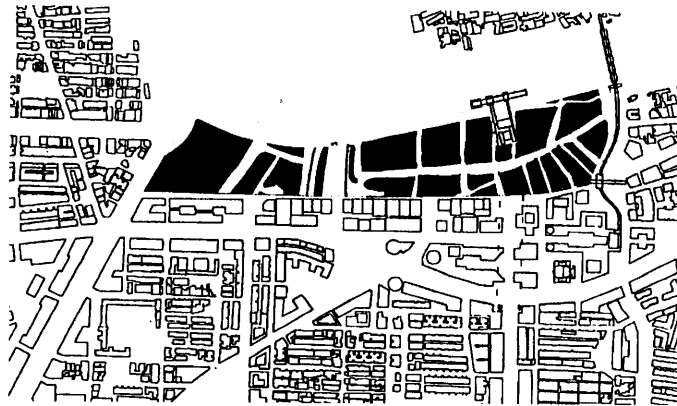
Los Angeles, California, USA

The large block sizes found in Los Angeles would become the equivalent of a megablock structure for Taipei. It is possible, however, to use the new internal spaces to reorder and restructure the spaces associated with the Night Market. It is problematic how to provide owners with enough incentives to undergo this restructuring, however.

Florence, Italy

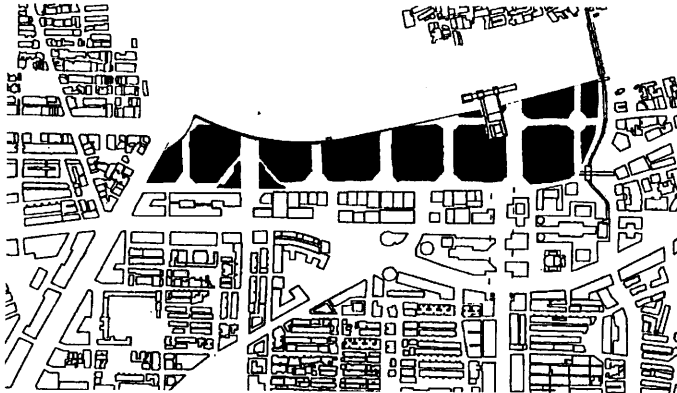
The grain of the Medieval fabric of Florence is too small, even for Taipei. It is not difficult, however, to imagine Jaoho Night Market having a similar figure-ground, meandering throughout the Sung Shan Riverfront Site. This richness of spaces, it can be argued, is the character-giving aspect of the site, and should not be lost in the development proposal. One strategy is to organize open spaces in clear orders, and let paths between them be much more serendipitous and whimsical.





North End, Boston, Massachusetts, USA

This figure-ground was chosen and placed explicitly because Hanover Street in Boston most closely resembles the scale and nature of Jaoho Street in Taipei. Hanover Street has been placed to coincide with the Night Market Street, though there is a discrepancy in density of buildings.



Barcelona, Spain

The 400- by 400-foot chamfered-corner blocks of Barcelona necessarily creates a condition of edge and core within. The literal adoption of this block system would cut off the continuity of Jaoho Night Market Street, and substitute a series of spaces within the core of the blocks. It is useful, however, to think of the whole Riverfront District as a edge condition, which protects the core of the Night Market.

APPENDIX C: COSTING MODELS

Notes: All values US\$ per square foot (Ping = 3.3 square meters = 33 square feet)

30 year building life

Parking does not count in Total FAR

Cost	\$/square foot	taxes	housing	4.00%
property cost	\$1,061		property	5.50%
construction cost	\$95		business	25.00%
maintenance	\$5			

FAR=3.5		Existing Building (High Commercial Rent)		
COST (1994\$)		REVENUE		
	\$/bld lifetime		\$/month	\$/bld lifetime
Total Property Cost	\$34,999,800	Total Retail Rent	\$267,300	\$96,228,000
Total Construction	\$11,024,475	Public Housing	\$95,700	\$34,452,000
Maintenance (30yr)	\$16,536,712	Market Housing	\$0	\$0
Taxes	\$27,360,069			
Total	\$89,921,056			\$130,680,000
Revenue - cost =	\$40,758,944	(R-C)/FAR	\$11,645,412	
Revenue / Cost	145.32%			

notes: values from City Hall Joint Development Financial Analysis, 1994

building life assumed to be 30 years

2nd floor retail rent is doubled from \$5.00/square foot due to 2nd level deck

FAR=3.5		Existing Building (Adjusted Commercial Rent)		
COST		REVENUE		
	\$/bld lifetime		\$/month	\$/bld lifetime
Total Property Cost	\$34,999,800	Total Retail Rent	\$123,750	\$44,550,000
Total Construction	\$11,024,475	Public Housing	\$95,700	\$34,452,000
Maintenance (30yr)	\$16,536,712	Market Housing	\$0	\$0
Taxes	\$14,440,569			
Total	\$77,001,556			\$79,002,000
Revenue - cost =	\$2,000,444	(R-C)/FAR	\$571,555	
Revenue / Cost	102.59%			

Assumptions:

	Revenue	FAR 1 = 33000.0	
	Rent/month	Sale	Area(FAR)
Housing Model			
Parking	\$5.00		0.0
1st floor retail	\$13.50		0.6
2nd floor retail	\$10.00		0.0
public residential	\$1.00	\$181	2.9
market residential	\$1.20	\$242	0.0
open spaces			0.0
		Total	3.5

Assumptions:

	Revenue	FAR 1 = 33000.0	
	Rent/month	Sale	Area(FAR)
Housing Model			
Parking	\$5.00		0.0
1st floor retail	\$6.25		0.6
2nd floor retail	\$5.00		0.0
public residential	\$1.00	\$181	2.9
market residential	\$1.20	\$242	0.0
open spaces			0.0
		Total	3.5

FAR=5.1		Proposed Building Without Towers		
COST			REVENUE	
	\$/bld lifetime		\$/month	\$/bld lifetime
Total Property Cost	\$34,999,800	Total Retail Rent	\$222,750	\$80,190,000
Total Construction	\$19,214,085	Public Housing	\$95,700	\$34,452,000
Maintenance (30yr)	\$28,821,128	Market Housing	\$0	\$0
Taxes	\$23,350,569			
Total	\$106,385,582			\$114,642,000
Revenue - cost =	\$8,256,418	(R-C)/FAR	\$1,618,906	
Revenue / Cost	107.76%			

Assumptions:

	Revenue	FAR 1 = 33000.0	
	Rent/month	Sale	Area(FAR)
Housing Model			
Parking	\$5.00		1.0
1st floor retail	\$6.25		0.6
2nd floor retail	\$5.00		0.6
public residential	\$1.00	\$181	2.9
market residential	\$1.20	\$242	0.0
open spaces			1.0
		Total	6.1

FAR=6.6		Proposed Building with Towers (All Units Rented)		
COST			REVENUE	
	\$/bld lifetime		\$/month	\$/bld lifetime
Total Property Cost	\$34,999,800	Total Retail Rent	\$222,750	\$80,190,000
Total Construction	\$23,938,860	Public Housing	\$95,700	\$34,452,000
Maintenance (30yr)	\$35,908,290	Market Housing	\$59,400	\$21,384,000
Taxes	\$24,205,929			
Total	\$119,052,879			\$136,026,000
Revenue - cost =	\$16,973,121	(R-C)/FAR	\$2,571,685	
Revenue / Cost	114.25%			

Assumptions:

	Revenue	FAR 1 = 33000.0	
	Rent/month	Sale	Area(FAR)
Housing Model			
Parking	\$5.00		1.0
1st floor retail	\$6.25		0.6
2nd floor retail	\$5.00		0.6
public residential	\$1.00	\$181	2.9
market residential	\$1.20	\$242	1.5
open spaces			1.0
		Total	7.6

FAR=6.6		Tower Units Sold, Base Units Rented		
COST			REVENUE	
	\$/bld lifetime		\$/month	\$/bld lifetime
Total Property Cost	\$34,999,800	Total Retail Rent	\$222,750	\$80,190,000
Total Construction	\$23,938,860	Public Housing	\$95,700	\$34,452,000
Maintenance (30yr)	\$28,821,127	Market Housing		\$11,999,790
Taxes	\$23,350,569			
Total	\$111,110,356			\$126,641,790
Revenue - cost =	\$15,531,434	(R-C)/FAR	\$2,353,248	
Revenue / Cost	113.97%			

Assumptions:

	Revenue	FAR 1 = 33000.0	
	Rent/month	Sale	Area(FAR)
Housing Model			
Parking	\$5.00		1.0
1st floor retail	\$6.25		0.6
2nd floor retail	\$5.00		0.6
public residential	\$1.00	\$181	2.9
market residential	\$1.20	\$242	1.5
open spaces			1.0
		Total	7.6

FAR=6.6		ALL UNITS SOLD		
COST			REVENUE	
	\$/bld lifetime		\$/month	\$/bld lifetime
Total Property Cost	\$34,999,800	Total Retail Rent	\$222,750	\$80,190,000
Total Construction	\$23,938,860	Public Housing		\$17,321,700
Maintenance (30yr)	\$15,119,280	Market Housing		\$11,999,790
Taxes	\$21,972,489			
Total	\$96,030,429			\$109,511,490
Revenue - cost =	\$13,481,061	(R-C)/FAR	\$2,042,585	
Revenue / Cost	114.03%			

Assumptions:

	Revenue	FAR 1 = 33000.0	
Housing Model	Rent/month	Sale	Area(FAR)
Parking	\$5.00		1.0
1st floor retail	\$6.25		0.6
2nd floor retail	\$5.00		0.6
public residential	\$1.00	\$181	2.9
market residential	\$1.20	\$242	1.5
open spaces			1.0
		Total	7.6

FAR=7.6		Additional Tower Units		
COST			REVENUE	
	\$/bld lifetime		\$/month	\$/bld lifetime
Total Property Cost	\$34,999,800	Total Retail Rent	\$222,750	\$80,190,000
Total Construction	\$27,088,710	Public Housing		\$17,321,700
Maintenance (30yr)	\$11,762,203	Market Housing		\$19,999,650
Taxes	\$21,972,489			
Total	\$95,823,202			\$117,511,350
Revenue - cost =	\$21,688,148	(R-C)/FAR	\$2,853,704	
Revenue / Cost	122.63%			

Assumptions:

	Revenue	FAR 1 = 33000.0	
Housing Model	Rent/month	Sale	Area(FAR)
Parking	\$5.00		1.0
1st floor retail	\$6.25		0.6
2nd floor retail	\$5.00		0.6
public residential	\$1.00	\$181	2.9
market residential	\$1.20	\$242	2.5
open spaces			1.0
		Total	8.6

BANKING MODEL

Variables:

public housing owner interest rate	8.50%	down payment	20%	30 year mortgage
public housing developer interest rate	6.00%	down payment	20%	
private housing owner interest rate	11.00%	down payment	25%	20 year mortgage
private developer interest rate	9.00%	down payment	35%	
presale percentage	70.00%			

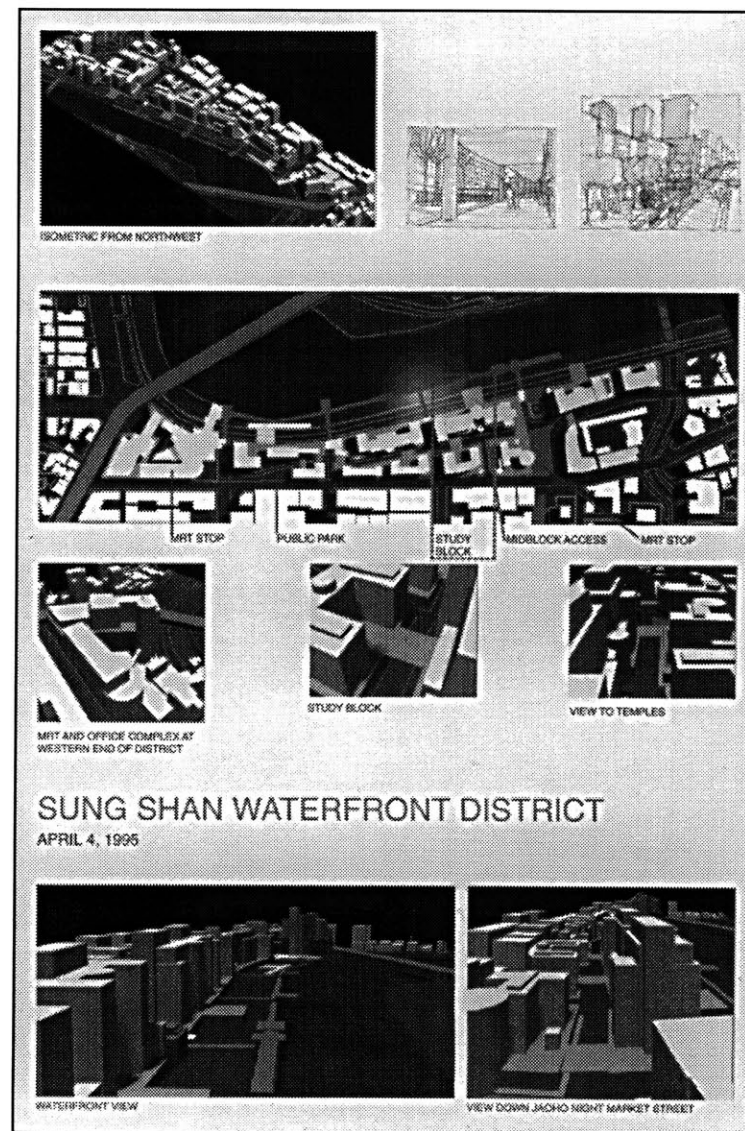
Revenue

Housing Model	Rent/month	Sale	Area in FAR	% of total
Parking	\$5.00		1	13%
1st floor retail	\$6.25		0.6	8%
2nd floor retail	\$5.00		0.6	8%
public residential	\$1.00	\$181.00	2.9	38%
market residential	\$1.20	\$242.42	1.5	20%
open spaces			1	13%

CALCULATION FOR A 1 SQUARE FOOT PROPERTY

YEAR	PUBLIC COST	PRIVATE COST	MAINT	PUBLIC REVENUE	PRIVATE REVENUE	COMM. RENT	TOTAL REVENUE	TOTAL COST	RUNNING REVENUE	RUNNING COST	R-C	REVENUE/COST
0	\$136.30	\$386.58	\$6.43	\$104.98	\$90.91	\$81.00	\$529.31	\$276.89	\$529.31	\$276.89	(\$252.42)	52.31%
1	\$50.89	\$100.51	\$6.43	\$49.69	\$43.64	\$81.00	\$157.83	\$174.33	\$687.14	\$451.21	(\$235.92)	65.67%
2	\$49.80	\$97.28	\$6.43	\$48.50	\$42.14	\$81.00	\$153.51	\$171.64	\$840.64	\$622.85	(\$217.79)	74.09%
3	\$48.71	\$94.05	\$6.43	\$47.31	\$40.64	\$81.00	\$149.18	\$168.95	\$989.83	\$791.80	(\$198.03)	79.99%
4	\$47.61	\$90.82	\$6.43	\$46.12	\$39.14	\$81.00	\$144.86	\$166.26	\$1,134.69	\$958.05	(\$176.64)	84.43%
5	\$46.52	\$87.59	\$6.43	\$44.93	\$37.64	\$81.00	\$140.54	\$163.57	\$1,275.23	\$1,121.62	(\$153.61)	87.95%
6	\$45.43	\$84.36	\$6.43	\$43.74	\$36.14	\$81.00	\$136.22	\$160.88	\$1,411.46	\$1,282.50	(\$128.96)	90.86%
7	\$44.34	\$81.13	\$6.43	\$42.55	\$34.64	\$81.00	\$131.90	\$158.19	\$1,543.36	\$1,440.69	(\$102.67)	93.35%
8	\$43.25	\$77.90	\$6.43	\$41.36	\$33.14	\$81.00	\$127.58	\$155.50	\$1,670.93	\$1,596.18	(\$74.75)	95.53%
9	\$42.16	\$74.67	\$6.43	\$40.17	\$31.64	\$81.00	\$123.26	\$152.81	\$1,794.19	\$1,748.99	(\$45.20)	97.48%
10	\$41.07	\$71.43	\$6.43	\$38.98	\$30.14	\$81.00	\$118.94	\$150.12	\$1,913.13	\$1,899.11	(\$14.02)	99.27%
11	\$39.98	\$68.20	\$6.43	\$37.79	\$28.64	\$81.00	\$114.62	\$147.43	\$2,027.75	\$2,046.54	\$18.79	100.93%
12	\$38.89	\$64.97	\$6.43	\$36.60	\$27.14	\$81.00	\$110.29	\$144.74	\$2,138.04	\$2,191.28	\$53.24	102.49%
13	\$37.80	\$61.74	\$6.43	\$35.41	\$25.64	\$81.00	\$105.97	\$142.05	\$2,244.01	\$2,333.33	\$89.31	103.98%
14	\$36.71	\$58.51	\$6.43	\$34.22	\$24.14	\$81.00	\$101.65	\$139.36	\$2,345.67	\$2,472.69	\$127.02	105.42%
15	\$35.62	\$55.28	\$6.43	\$33.03	\$22.64	\$81.00	\$97.33	\$136.67	\$2,443.00	\$2,609.36	\$166.36	106.81%
16	\$34.53	\$52.05	\$6.43	\$31.84	\$21.14	\$81.00	\$93.01	\$133.98	\$2,536.01	\$2,743.34	\$207.33	108.18%
17	\$33.44	\$48.82	\$6.43	\$30.65	\$19.64	\$81.00	\$88.69	\$131.29	\$2,624.70	\$2,874.63	\$249.93	109.52%
18	\$32.35	\$45.59	\$6.43	\$29.46	\$18.14	\$81.00	\$84.37	\$128.60	\$2,709.06	\$3,003.23	\$294.16	110.86%
19	\$31.26	\$42.36	\$6.43	\$28.27	\$16.64	\$81.00	\$80.05	\$125.91	\$2,789.11	\$3,129.14	\$340.03	112.19%
20	\$30.17	\$39.13	\$6.43	\$27.08	\$15.14	\$81.00	\$75.73	\$123.22	\$2,864.84	\$3,252.36	\$387.52	113.53%
21	\$29.08	\$0.00	\$6.43	\$25.90	\$0.00	\$81.00	\$35.51	\$106.90	\$2,900.34	\$3,359.25	\$458.91	115.82%
22	\$27.99	\$0.00	\$6.43	\$24.71	\$0.00	\$81.00	\$34.42	\$105.71	\$2,934.76	\$3,464.96	\$530.20	118.07%
23	\$26.90	\$0.00	\$6.43	\$23.52	\$0.00	\$81.00	\$33.33	\$104.52	\$2,968.09	\$3,569.47	\$601.38	120.26%
24	\$25.81	\$0.00	\$6.43	\$22.33	\$0.00	\$81.00	\$32.24	\$103.33	\$3,000.33	\$3,672.80	\$672.47	122.41%
25	\$24.72	\$0.00	\$6.43	\$21.14	\$0.00	\$81.00	\$31.15	\$102.14	\$3,031.47	\$3,774.94	\$743.46	124.52%
26	\$23.63	\$0.00	\$6.43	\$19.95	\$0.00	\$81.00	\$30.06	\$100.95	\$3,061.53	\$3,875.88	\$814.35	126.60%
27	\$22.54	\$0.00	\$6.43	\$18.76	\$0.00	\$81.00	\$28.97	\$99.76	\$3,090.49	\$3,975.64	\$885.14	128.64%
28	\$21.44	\$0.00	\$6.43	\$17.57	\$0.00	\$81.00	\$27.88	\$98.57	\$3,118.37	\$4,074.21	\$955.84	130.65%
29	\$20.35	\$0.00	\$6.43	\$16.38	\$0.00	\$81.00	\$26.78	\$97.38	\$3,145.15	\$4,171.58	\$1,026.43	132.64%
30	\$19.26	\$0.00	\$6.43	\$15.19	\$0.00	\$81.00	\$25.69	\$96.19	\$3,170.85	\$4,267.77	\$1,096.92	134.59%

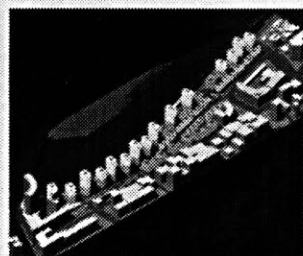
APPENDIX D: PRESENTATION BOARDS



A NEW VISION FOR TAIPEI'S SUNG SHAN RIVERFRONT DISTRICT

A THESIS PROPOSAL SUBMITTED TO THE SCHOOL OF ARCHITECTURE AND PLANNING FOR PARTIAL FULFILLMENT OF THE DEGREES OF MASTER OF ARCHITECTURE AND MASTER OF CITY PLANNING BY PAUL WANG, SPRING 1995





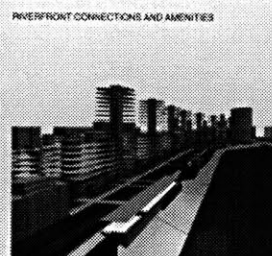
COMMERCIAL / INSTITUTIONAL
COMPLEX AT WEST END OF SITE



HOUSING REDEVELOPMENT AT HIGHER DENSITY CREATING
RICHER URBAN SPACES



REDEVELOPED NIGHT MARKET STREET



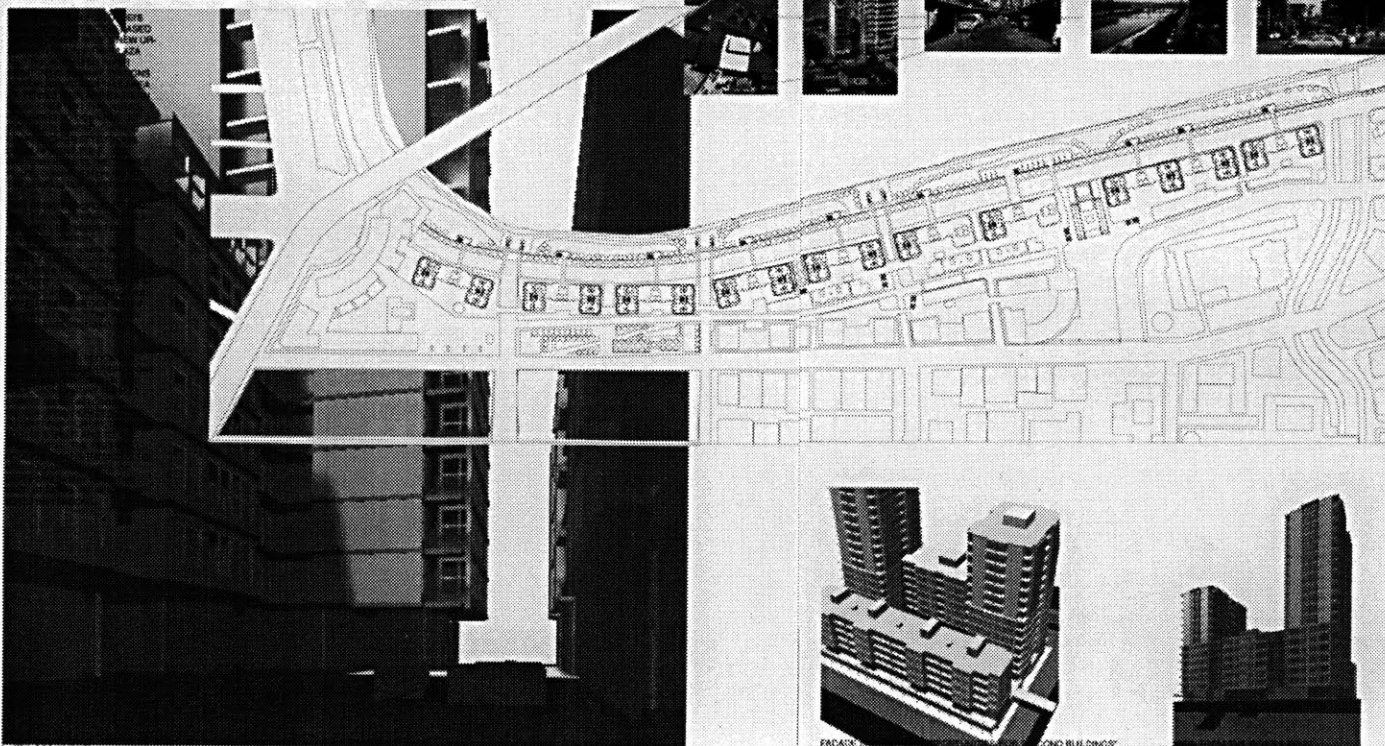
RIVERFRONT CONNECTIONS AND AMENITIES



VIEW NORTH TO TEMPLE

TEMPLE PLAZA

A NEW VISION FOR TAIPEI'S SUNG SHAN RIVERFRONT DISTRICT



GROUND FLOOR RETAINS NIGHT
MARKET ACTIVITIES WITH PARKING
BELOW



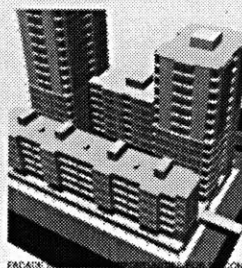
SECOND FLOOR CONNECTS TO THE
RIVERFRONT AND CONTAINS NEIGHBOR-
HOOD COMMERCIAL USES



A VARIETY OF FLEXIBLE FLOOR PLANS
ACCOMMODATES PUBLIC/MARKET HOUSING
SECTORS



ROOFTOP AMENITIES TARGET MARKET
HOUSING SECTOR IN TOWERS



FACADE

"TOWER BUILDINGS"



